

CHEMICAL AND HAZARDOUS WASTE IN INDIA A SECTORAL ANALYSIS

Edited by : Sairam Bhat



Center for Environmental Law, Education, Research and Advocacy



Ministry of Environment, Forest & Climate Change, Government of India

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National Law School of India University, Bengaluru



Ministry of Environment, Forest & Climate Change

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PREFACE

The chemical sector in India is an industry in its own right for the sheer expanse of its operations, the bulk of raw materials it produces for itself and other allied sectors and the diverse industries it supports. The wide and disparate range of products directly and indirectly manufactured by the chemical industry can be grouped into a number of categories, such as inorganic chemicals, synthetic organic chemicals like drugs and pharmaceuticals, dyes and intermediates, pigments, pesticides, petrochemicals, paper, etc. In addition to the core industrial sectors, the chemical industry also contributes to several sectors that cater to the household consumer products including pharmaceuticals, cosmetics, paints, disinfectants among variety of other products. India also produces a large number of chemicals which have very specific usage as food additives, pigments, polymer additives, anti-oxidants in the rubber industry etc. The chemical sector has been extended a supportive arm by the Government through the policy and fiscal measures. Special focus on research and development, policy initiatives, increased investment incentives, reduction of basic customs duty on several imported products, along with other beneficial measures. Under the 'Make in India' initiative, the Government has opened up the petrochemical sector to explore opportunities to improve domestic production, establishment of petroleum, chemicals and petrochemical investment regions. With the main objective of developing end-to-end manufacturing ecosystem through the growth of clusters for specialized products using chemicals.

Owing to the wide spectrum of products manufactured and supported by the Indian Chemical Industry, the rapid expansion of the sector and the increasing development of new products, a number of environmental and health risks have surfaced and the Indian Government has been mindful of the development. Legislation covering different stages of the life-cycle of chemicals, including production, manufacture, sale, distribution, export, import, labeling, disposal and waste management have been comprehensively drafted. Additionally, specific legal instruments have been framed to deal with particular categories of chemicals, such as pesticides, petroleum, cosmetics, pharmaceuticals etc. Many of these laws, regulations, standards, have been framed to align with the obligations of the country under the multilateral environmental agreements to which India is a party including the Rotterdam Convention on Prior Informed Consent Procedure, that have identified specific focus areas for interventions and implementation. Over and above the legal instruments that regulate hazardous chemicals and waste, the Judiciary has intervened time and again through a number of judicial pronouncements in an attempt to streamline the handling of hazardous chemicals and waste management efforts. Through these judgements, adequate attention has been drawn by the higher judiciary to the role that should be played by the different regulatory bodies including the Central and the State Pollution Control Boards in hazardous and chemical waste management and handling. Commissions and Committees have been set up by the Supreme Court and the National Green Tribunal to assess, report and suggest holistic measures to improve hazardous waste management in the country and any literature that details the regulatory mechanism governing hazardous chemicals and waste must necessarily make reference to the contributions of these Committees.

This Book, the second in the series of publications under the Three-Year Project granted to Centre for Environmental Law, Education, Research and Advocacy (CEERA) by the Ministry of Environment, Forest and Climate Change on Collaborative Engagement for Research. Training and Development in Handling of Chemical and Hazardous *Waste* is in continuation of its efforts initiated through the first publication. This Book endeavors to provide for a more in-depth study into the laws governing some specific chemical sectors and delves deeper into some specific subjects that were briefly discussed and touched upon in the first edition. Spread across four parts, this book has covered, under Part A, subjects that include different approaches that can be adopted by the regulatory authorities and stakeholders in handling hazardous and chemical waste; international chemical trade; labeling requirements for chemicals; application of the principle of Extended Producer Responsibility in chemical and hazardous waste management; chemical safety and disaster management in the chemical sector and Committees established by the Judiciary to control and abate the generation of hazardous waste. Part B of the book deals with Focus Areas under the Rotterdam Convention and delineates the country's obligations under the Convention. This part enlists the Indian regulatory framework governing hazardous pesticide formulations and legislative efforts taken by the Government to fulfill the mandate of the Convention.

Under this project, CEERA, through an unprecedented and pioneering move, has collaborated with five law universities to study the management and disposal of hazardous chemicals and waste in the Eastern, Western, Northern, Southern and Central regions of the country. The research undertaken by the regional partners in the project, which primarily highlights the awareness and compliance of waste management laws, implementation challenges, along with the recommendations, has been covered under Part C of this book. The final part of the book, Part D attempts to apprise the readers with a holistic overview of six major chemical sectors in the country, the laws and regulatory framework governing them, ban orders passed by the Government and the specific international Conventions and Treaties that apply to them.

The *First Chapter*, 'Integrated Approach to Chemical and Hazardous Waste Handling' gives an overview of the different approaches for efficient waste management by broadly classifying the approaches under two heads - directive and non-directive approaches.

The *Second Chapter*, sheds light on the regulation of imports of hazardous waste and chemicals in India. It discusses the impact of such wastes on the environment and major actors involved in foreign trade of chemicals and hazardous waste. It goes on to describe the historical background of the foreign trade in chemicals in India and the legal framework developed for such trade. Furthermore, the multilateral agreements and conventions that apply to such trade in chemicals and waste are also highlighted in the chapter.

The *Third Chapter* draws attention to the importance of appropriately labeling chemicals and hazardous waste to ensure protection of the environment, and people from the adverse effect of chemicals. The chapter also analyses the international and national legal framework applicable to the labeling of chemicals through a critical lens and proposes necessary changes that can be adopted to address the issues identified.

The *Fourth Chapter* discusses Extended Producer Responsibility which extends the responsibility of the producer to the entire life cycle of the product chain. It further discusses the producer's obligations, the difference between individual producer responsibility and collective producer responsibility, the take back system, mechanisms for collecting and transporting e-waste to reuse and recycle and the monitoring of implementing strategies and plans. The international Conventions that incorporate obligations under EPR like the Basel Convention, Rotterdam Convention and London Protocol have also been highlighted.

The *Fifth Chapter* sheds light on chemical safety, poison control and disaster management in India. It makes a comparison of the chemical safety and regulation of hazardous substances in developed and developing countries, while discussing best practices in the implementation of hazardous chemical laws with specific reference to disaster management across jurisdictions. The legislative framework with respect to chemical safety, poison control and disaster management is also discussed at length in this chapter. Lastly, a sectoral study of implementation of chemical and poison safety laws by the Indian companies in the agrochemical sector, the paint sector, the textile sector and the FMCG sector has been carried out in this chapter.

The *Sixth Chapter* delineates the role of committees constituted by the higher judiciary for the management of hazardous waste in India. The ever-expanding role of the Indian Judiciary in relation to its hazardous waste management objectives has been discussed. This chapter seeks to provide readers with an exhaustive account of the working of four committees established by the Supreme Court and the National Green Tribunal, namely, the High-Powered Committee (HPC), the Supreme Court Monitoring Committee (SCMC), the Technical Experts Committee (TEC), and the Monitoring Committee. Primarily, the timeline of the functioning of the Committees, in addition to their orders and recommendations have been critically examined in this chapter.

The *Seventh* and *Eighth Chapter* under Part B of the book discuss the focus areas under the Rotterdam Convention with special emphasis on the legal and regulatory framework in India that governs hazardous pesticides and industrial chemicals that have an impact on health and environment. The chapter provides insight about the statistics on production, import and export of pesticides and industrial chemicals in India when compared to other chemicals. Since the Rotterdam Convention plays an essential role in the regulation of pesticide use in India, the chapter not only attempts to uncover the role of the Convention, but additionally delineates laws in India that aid the implementation of its principles, and the penal provisions that apply for the violation of the legal principles.

The *Eighth Chapter* investigates various facets of the Rotterdam Convention and international chemical trade including but not limited to labeling requirements,

safe handling guidelines, coding systems, restrictions on importation and bans. Further, it discusses the procedure for prior informed consent which facilitates the dissemination of information between State parties prior to import/export of chemicals and pesticides, and largely forms the foundation of the Convention.

The *Ninth Chapter* briefly outlines the research findings of the regional partners under this project. The chapter summarises the primary areas of research focussed by the regional partners in their respective states. In South India the role of chemical industries in management and disposal of chemical wastes in Kerala, with a specific reference to the insecticide Endosulfan has been made. In the central region, the state of Madhya Pradesh has been studied. Chemical waste is generated in the state not only by large industries in the auto, construction and textile sectors but also by small and medium scale industries, which makes the state feature amongst the top 11 chemical waste generating states in India. In Eastern India, the state of West Bengal accounts for more than 55% of the hazardous chemical wastes imported into the country. In Western India, the state of Maharashtra, and in particular, the region comprising of Pune, Satara and Solapur – the state's largest hazardous chemical waste generator have been studied.

Part D of the Handbook comprises *Chapter 10 to Chapter 15* and each chapter gives a comprehensive overview of major chemical sectors in the country including organic chemicals, paints and dyes, pharmaceuticals, chemicals used in the cosmetics and food industry, agrochemicals and petrochemicals. The topics covered by these chapters include the regulatory framework for the manufacture and production, packaging and labeling, storage and transportation, sale and distribution, import and export; the relevant international instruments governing the sector, any ban or restriction placed by the government with respect to the use of chemicals in these sectors.

CEERA through the publication of this book seeks to fulfill the three pronged deliverables of research, publication and capacity building under the project granted by the Ministry of Environment, Forest and Climate Change. This publication autonomously driven by CEERA covers the different implications that the multidimensional problem of hazardous waste management entails for a country like India and also encompasses issues pertaining to the five Multilateral Environmental Agreements. This book can serve as a resource and reference material for dissemination to the public and also be used as a guidance document for different

capacity building programmes initiated by CEERA and the Ministry. Designed for a diverse audience including all stakeholders of the chemical sector, academicians and students in the field of law, environmental studies and the STEM fields, this book will acquaint its readers *inter alia* with an understanding of the legal framework that regulates the issue in the national and the international sphere.

The team acknowledges the contributions of the regional partners – West Bengal National University of Juridical Sciences, Kolkata; School of Law, Bennett University, Greater Noida; School of Law, Jagran Lakecity University, Bhopal; Symbiosis Law School, Pune and School of Law, CUSAT, Kochi for their involvement in the project and the assistance provided by interns in the finalisation of this book.

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LIST OF ABBREVIATIONS

ACM	Asbestos-containing materials
ADI	Accepted Daily Intake
AMR	Anti-Microbial Resistance
APEO	Alkylphenol ethoxylates
API	Active Pharmaceutical Ingredients
ARF	Advance Recycling Fees
ASEAN	Association of Southeast Asian Nations
AYUSH	Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy
B2B	Business-to-business
B2C	Business-to-consumer
BIS	Bureau of Indian Standards
BMW	Biomedical Waste
BOD	Biological Oxygen Demand
BTP	Bio-technology Parks
BTXN	Benzene, Toluene, Xylene, Naphthalene
CAGR	Compound Annual Growth Rate
CDSCO	Central Drugs Standard and Control Organization
CETP	Common Effluent Treatment Plant
CILSS	Comité permanent Inter-Etats de Luttecontre la
	Sécheressedans le Sahel
COD	Chemical Oxygen Demand
СоР	Conference of Parties
CPCB	Central Pollution Control Board
CPR	Collective Producer Responsibility
CREP Programmes	Corporate Responsibility for Environmental Protection
	Programmes
CSB	U.S. Chemical Safety Board
CSE	Centre for Science and Environment
CSP	Sahelian Pesticide Committee
CTE	Consent to Establish

СТО	Consent to Operate
DCC	Drugs Consultative Committee
DCPC	Department of Chemicals and Petro-Chemicals, Ministry of
	Chemicals and Fertilisers
DDT	Dichlorodiphenyltrichloroethane
DfD	Design for Disassembly
DfE	Design for Environment
DGCIS	Director General of Commercial Intelligence and Statistics
DGD	Decision Guidance Document
DGFT	Director General of Foreign Trade
DGHS	Directorate-General for Health Services
DNA	Designated National Authority
DPIIT	Department for Promotion of Industry and Internal Trade,
	Ministry of Commerce and Industry
DTAB	Drugs Technical Advisory Board
EC	Environmental Clearance
ECHA	European Chemicals Agency
EHTP	Electronics Hardware Technology Parks
EIA	Environment Impact Assessment
ELV	End of Life Vehicle
EMP	Environmental Monitoring Program
EOU	Export Oriented Units
EPA	Environmental Protection Agency (USA)/ Environment
	(Protection) Act, 1986 (India)
EPCG Scheme	Export Promotion Capital Goods Scheme
EPPP	Environmentally Persistent Pharmaceutical Pollutants
EPR	Extended Producer Responsibility
ETP	Effluent Treatment Plant
EU	European Union
FAO	Food and Agriculture Organisation
FDI	Foreign Direct Investment
FRA	Final Regulatory Action
FSSAI	Food Safety and Standards Authority of India

FY	Financial Year
GAELP	Global Alliance to Eliminate Lead Paint (Lead Paint Alliance)
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GHG	Green House Gases
GHS	Globally Harmonized System of Classification and Labelling of Chemicals
GLP	Good Laboratory Practices
GMP	Good Manufacturing Practices
GoI	Government of India
GPS	Global Positioning System
GRAS	Generally Recognized as Safe
GST	Goods and Services Tax
HASE	Hydrophobically-modified Alkali-Swellable Emulsion
HEUR	Hydrophobically modified Ethoxylated Urethane
HPC	High Powered Committee
HRVCA	Hazard Risk Vulnerability and Capacity Assessment
HSMD	Hazardous Substances Management Division, MoEF&CC
ICAR	Indian Council of Agricultural Research, New Delhi
ICCM	International Conference on Chemicals Management
IFCS	Intergovernmental Forum on Chemical Safety
IICT	Indian Institute of Chemical Technology
IIP	Indian Institute of Petroleum, Dehradun
ILO	International Labour Organisation
INC	International Nomenclature Committee
INCI	International Nomenclature of Cosmetic Ingredients
IPR	Individual Producer Responsibility
IRPTC	International Register of Potentially Toxic Chemicals
IS	Indian Standard
ISWM	Integrated Sustainable Waste Management
ITC- HS Codes	Indian Trade Clarification based on Harmonized System of Coding
LD	Lethal Dose

LIRA	Legal and Institutional infrastructures for the sound
	management of chemicals and measures for Recovering costs
	of national Administrations
MC	Monitoring Committee
MCA	Ministry of Corporate Affairs
MEA	Multilateral Environment Agreements
MEC	Measured Environmental Concentration
MEIS	Merchandise Exports from India Scheme
MLP	Multi-Layer Plastics
MoEF&CC	Ministry of Environment, Forests and Climate Change
MSIHC Rules	Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
MSME	Micro, Small and Medium Enterprises
NCC	National Cadet Corps
NCL	National Chemical Laboratory, Pune
NCP	National Oil and Hazardous Substances Pollution
	Contingency Plan (USA)
NDCH	National Disaster Command Headquarters (Thailand)
NDMA	National Disaster Management Authority
NDPMC	National Disaster Prevention and Mitigation Committee (Thailand)
NDRF	National Disaster Response Force
NEERI	National Environmental Engineering Research Institute,
	Nagpur
NFRA	Notification of Final Regulatory Action
NG	Natural Gas
NGOs	Non-Government Organisations
NGT	National Green Tribunal
NOC	No Objection Certificate
NRS	National Response System (USA)
NSS	National Service Scheme
NYKS	Nehru Yuva Kendra Sangathan
OCSPP	Office of Chemical Safety and Pollution Prevention (USA)

ODC	Ozone Depleting Chemicals
OECD	Organisation for Economic Co-operation and Development
OPPT	Office of Pollution Prevention and Toxics (USA)
PCB	Polychlorinated Biphenyls
PCC	Pollution Control Committee
PCPIR	Petroleum, Chemicals and Petrochemical Investment Regions
PIC	Prior Informed Consent
PNEC	Predicted No-Effect Concentration
POP	Persistent Organic Pollutants
PPCP	Pharmaceuticals and Personal Care Products
PPE	Personal Protective Equipment
ppm	parts per million
PPP	Polluter Pays Principle
PRO	Producer Responsibility Organisations
PSU	Public Sector Undertakings
PVC	Polyvinyl chloride
QR Code	Quick Response Code
R&D	Research and Development
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RLNG	Regasified Liquefied Natural Gas
RR	Recurring/ Regular Responsibility
SAICM	Strategic Approach to International Chemicals Management
SCMC	Supreme Court Monitoring Committee
SCOMET	Special Chemicals, Organisms, Materials, Equipment and Technologies
SDG	Sustainable Development Goals
SDMA	State Disaster Management Authority
SDRF	State Disaster Response Force
SDS	Safety Data Sheet
SEIS	Service Export from India Scheme
SOP	Standard Operating Procedures
SPCB	State Pollution Control Boards

STE	State Trading Enterprises
STP	Software Technology Parks
SWIFT	Single Window Interface for Facilitating Trade
TDG	Transport of Dangerous Goods
TDS	Total Dissolved Solids
TEC	Technical Experts Committee
TIPMSE	Thailand Institute of Packaging and Recycling Management for Sustainable Environment
TPO	Third Party Organisations
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage and Disposal Facilities
TSSs	Total Suspended Solids
TUFS	Technology Upgradation Fund Scheme
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
UoI	Union of India
USA	United States of America
USD	United States Dollar
UT	Union Territory
VOC	Volatile Organic Compounds
WCO	World Custom Organisation
WHO	World Health Organisation
WMO	Waste Management Officer
WTO	World Trade Organisation

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PART - A

CHEMICAL AND HAZARDOUS WASTE HANDLING IN INDIA

CHAPTER 1

INTEGRATED APPROACH TO CHEMICAL AND HAZARDOUS WASTE HANDLING

INTRODUCTION

Chemical and hazardous waste can cause devastating damage to the environment. The effective handling of hazardous waste is therefore imperative to diminish and avoid its adverse repercussions. However, finding the best measures to handle such waste is challenging at most times. The measures taken should be precautionary and adept at regulating all stages of chemical and hazardous waste, from generation to disposal. Mindful of this need to effectively manage the chemical and hazardous waste, nations have adopted different approaches, or combinations of these approaches, that can be narrowed down to directive and non-directive approaches. India employs a mix of these two approaches to regulate and manage chemical and hazardous waste.

Directive approach

The '*Directive Approach*' follows a "command and control" technique where public officials prescribe courses of action to regulate¹ firms or individuals. This approach involves Governments regulating industries through various methods. These methods include banning the production or manufacturing of certain chemicals, establishing certain uniform standards for the production, or manufacture of chemicals or hazardous products.²

Under the directive approach, India predominantly employs the methods of imposing bans and establishing standards, either through direct orders or through a statutory framework. For instance, in India, the Bureau of Indian Standards (BIS) has laid down various standards for the use of chemicals by industries in various products.³ Recently, the Ministry of Chemicals and Fertilizers announced plans to make

2 *Id*.

¹ Charles Davis, Approaches to the Regulation of Hazardous Wastes, 18 Environmental Law, Lewis & Clark Law School 505 (1988).

³ *BIS list of standards relating to Chemicals*, BUREAU OF INDIAN STANDARDS, https://www.services.bis.gov. in:8071/php/BIS/PublishStandards/published/pub_stn_list/62 (last visited June 09, 2020).

seventy-two chemical and petrochemical standards mandatory, pursuant to which the BIS is to draw up 14 new standards and revise 18 existing ones.⁴ Alongside laying down standards, the Indian Government has time and again introduced various bans on hazardous chemicals. Recently, the Ministry of Agriculture and Farmers' Welfare issued the Pesticides (Prohibition) Order, 2018,⁵ which banned 18 hazardous pesticides. The ban applies to the registration, import, manufacture, formulation, transport, sale and use of these pesticides.

In addition to these bans and standards, statutes and subsequent rules have been enacted by Parliament and the Indian Government to regulate the chemicals and hazardous waste. Some of the legislations that deal with the production, storage, transportation, handling and disposal of hazardous and chemical waste are as follows:

- The Water (Prevention and Control of Pollution) Act, 1974
- The Air (Prevention and Control of Pollution) Act, 1981
- The Environment (Protection) Act, 1986
- The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 as amended up to 2020
- The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended up to 1994
- The Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996
- The Bio-Medical Waste Management Rules, 2016 as amended up to 2019
- The Solid Waste Management Rules, 2016 as amended up to 2020
- The Ozone Depleting Substances (Regulation and Control) Rules, 2000 as amended up to 2019
- The Batteries (Management and Handling) Rules, 2001 as amended up to 2010
- The Electronic Waste (Management) Rules, 2016 as amended up to 2018
- The Plastic Waste Management Rules, 2016 as amended up to 2018

⁴ *India proposes making 72 chemical standards mandatory*, CHEMICAL WATCH (Nov. 06, 2019), https://chemicalwatch.com/84247/india-proposes-making-72-chemical-standards-mandatory.

⁵ Ministry of Agriculture and Farmers Welfare, S.O. 3951(E), (Notified on Aug. 8, 2018), http://agricoop. nic.in/sites/default/files/18%20pesticde%20banning%20188458.pdf.

These legislations and regulations have established an administrative framework to implement and ensure compliance with the various laws. In case of non-compliance, industries are liable to be punished and proceeded against. Through bans, standards, and regulatory frameworks, every stage of chemical waste generation is sought to be regulated.

The handling of chemical and hazardous waste involves numerous processes and changing of hands, from the manufacturer to recycler to exporter, etc. Thus, several administrative procedures are detailed in various Acts to handle chemical and hazardous wastes specific to different fields or industries. On a general basis, legislations such as the Customs Act, 1962 provide a general administrative framework to regulate the import and export of chemical and hazardous wastes. However, from the environmental point of view, various environmental legislations such as the Hazardous Waste Management Rules, 2016 lays down a targeted framework to handle the chemical and hazardous wastes. Such laws aim at minimizing and eliminating any possible damages to the environment during the handling process.

Similarly, at an international level, 'bans' on the production of certain hazardous chemicals are desirable in cases where the chemicals can threaten human health and/ or the surrounding environment if improperly released into the atmosphere. Several international chemical Multilateral Environment Agreements (MEAs) restrict or ban the production, use, and trade of certain hazardous chemicals to protect human health and the environment. Examples of such MEAs include the Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal; the Rotterdam Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade; the Montreal Protocol of 1987; the Stockholm Convention on Persistent Organic Pollutants; the Minamata Convention on Mercury; the Strategic Approach on International Chemicals Management; the ILO Chemicals Convention on Strategic Approach on International Chemicals Management; and the Montreal Protocol on Substances that Deplete the Ozone Layer. Out of these, the Rotterdam Convention is one international treaty that has banned or restricted certain hazardous chemicals and pesticides. Annexure III of the Convention lists 53 banned chemicals, of which 36 are pesticides and 15 are industrial chemicals. Through its nodal agency, the Ministry of Environment, Forest and Climate Change, India is a party to these MEAs. These MEAs seek to provide a legislative and policy framework to promote safety in chemical handling and sustainable development, prevent environmental pollution, and reduce adverse impacts on the health of humans and other living beings.

Non-Directive approach

In contrast with the directive approach, the '*Non-Directive approach*' is used by public officials to induce compliance with rules and regulations by industries through the manipulation of various incentives.⁶ The 'Non-Directive' regulatory approach can involve political and economic incentives. Economic incentives include fee structures, taxes, changing conceptions of liability, efforts to encourage recycling and the use of waste exchange systems.⁷ On the other hand, political incentives include-(a) the dissemination of information or public education; (b) requirements for citizen comments prior to the adoption of critical regulatory decisions; (c) placing greater emphasis on cooperative action (such as prior consultation) between policy actors involved in program implementation; and (d) the encouragement of problem solving by regional organisations as a means of handling multi-jurisdictional problems.⁸

In India, the chemical sector is regarded as a diversified industry, churning out over 80,000 commercial products. Micro, Small and Medium Industries (MSMEs) dominate this sector and are assisted by the government in several ways. In terms of economic incentives, both central and state governments provide help and support to the industries by means of- (a) financing through loans; (b) capacity development through training programs and workshops; (c) infrastructure; and (d) raw materials and technology.

Besides regulatory mechanisms, a number of non-regulatory mechanisms play a vital role in the management of chemicals in India.⁹ These include (a) initiatives and voluntary actions taken by industrial associations in setting standards for the management of an organisation's environmental impacts; (b) product certification and the issuance of licences to abate harmful impact on the environment; and (c) the adoption of clean technologies and improvement in management practices under CREP (Corporate Responsibility for Environmental Protection) Programmes.

⁶ Charles Davis, *supra* note 1.

⁷ Id.

⁸ Id.

⁹ SAIRAM BHAT, THE LEGAL, REGULATORY AND COMPLIANCE FRAMEWORK ON CHEMICAL AND HAZARDOUS WASTE IN INDIA (2019).

Such programmes are formulated by the Central Pollution Control Board through industry-specific interactions and meetings.¹⁰

Internationally, some countries have successfully adopted the non-directive approach to tackle their mounting waste. Columbia, for example, adopted ECOBOT, a recycling initiative under which the Government installed reverse vending machines across the country. The citizens can put their recyclable waste, such as plastic bottles, in such machines in exchange for money. In Indonesia, low-income households can transfer their recyclable waste to clinics, which then sells the same and use the earnings to cover the basic health insurance of the citizens.¹¹

In India, there is a need to adopt a mixed approach that should involve all stakeholders to develop a successful waste management policy for chemical and hazardous waste.

JUDICIAL APPROACH TO HAZARDOUS WASTE MANAGEMENT

Handling chemical and hazardous waste is a complicated matter due to its substance composition and the potential impact on human health and environment from direct or indirect exposure. Chemical and hazardous waste can be very dangerous to humans and the environment if used or released improperly at any stage, from production to storage, transportation, handling, use, and disposal.

In India, in addition to the various environmental legislations, the Hazardous Waste (Management and Handing) Rules, 1989 were implemented to effectively manage hazardous waste. However, the Rules proved insufficient in light of different irregularities and mounting hazardous waste generation. The serious plight of the nation's inefficient hazardous waste management was brought to the notice of the Indian Judiciary. The Courts, in their judicial wisdom, had laid down guidelines to handle the hazardous waste.

Perhaps, the single most important case in this field is *Research Foundation for Science Technology and Natural Resource Policy v. Union of India & Ors.*¹² In this case, the Supreme Court dealt with the disposal of 133 containers containing hazardous waste at the Nhava Seva Port. After perusing the evidence adduced, the Court concluded

¹⁰ *Id*.

¹¹ Anisha Bhatia, *5 Countries That Have Revolutionised The Way They Tackle Waste*, SwachhIndia (Apr. 26, 2017), https://swachhindia.ndtv.com/5-countries-revolutionised-way-tackle-trash-waste-5013/.

¹² Research Foundation for Science Technology and Natural Resource Policy v. Union of India, Unreported Judgements, Writ Petition No. 657 of 1995, decided on 11/09/2007 (SC).

that importers had illegally imported waste oil in the said containers, in the garb of lubricating oil. The Court analysed Article 9(2)(a) of the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal. This provision provides that in the case of illegal trafficking of waste by the exporter, the waste should be taken back by them. The Court held that even though there were provisions fastening such liability both in the Basel Convention and in India's national laws, a holistic view of the situation needed to be adopted in determining the exporters' liability. The exporters would not be willing to take back the cargo after 4 years. Moreover, a considerable amount of time would be wasted in adhering to different protocols. Against this backdrop, the possibility of disposing the oil locally as a one-time measure was examined.

Paragraph 30 of the "Technical Guidelines on Hazardous Waste: Waste Oils from Petroleum Origins and Sources", issued by the Basel Convention, was analysed by the Court. It indicates that several countries have brought about legislations to define 50 parts per million (ppm) as the maximum permissible limit of concentration of polychlorinated biphenyls (PCBs) for marketing and use. The importers therefore, in the present case contended that their material was not hazardous waste, since it had not violated the 50-ppm limit prescribed in the Basel Convention.

The Court emphasized that this contention had no strength if not examined in the light of India's domestic laws. Such laws have been framed to align the country's legal system with the recommendations of the Convention. The contents of the Convention were by themselves not implementable as 'law'. They were only guidelines to the member nations, and the final determination of the hazardous nature of the material could not be undertaken based on them alone. Individual countries could provide for different limits of concentration of PCBs to label the substance as hazardous waste.

Under the national laws of India, the import of waste oil containing PCBs of any detectable limit had been banned. The Court concluded that the national law was applicable, and shelter could not be sought under guidelines of the Basel Convention. The Monitoring Committee constituted under the Court in this case had recommended the destruction of the consignment by incineration. Regarding the liability of the importers to pay the amounts for this destruction, the Court stressed that the liability could be fastened under the precautionary principle and polluter pays principle. These principles are part of the environmental law jurisprudence of India.

The polluter pays principle essentially implies that the producer of goods or other items should be responsible for the cost of preventing, or dealing with, any pollution caused. This cost includes the environmental cost, the direct cost to the people or property, and the cost incurred in avoiding pollution. In connection to this, the Court also analysed the applicability of the rule in *Rylands* v. *Fletcher*,¹³ and decided that the exceptions outlined in the case were inapplicable to an industrialised economy. It stressed that courts had to evolve new principles that would adequately deal with the new problems in a highly industrialised economy. It might be necessary to construct a new principle of liability to deal with an unusual situation which might arise on account of hazardous industries. In such situations, the Court should not hesitate to evolve principles of liability because of a lack of the same in England. An enterprise engaged in a hazardous activity, and posing a potential threat to the health and safety of people, owed an absolute and non-delegable duty to the community to prevent any harm. It was under an obligation to conduct the hazardous activity with the highest standards of safety. In case of any harm, the enterprise was strictly and absolutely liable to compensate those affected by the accident, as a part of the social cost for carrying on such activity. This liability accrued regardless of whether the activity was carried out carefully. Further, such liability was not subject to any of the exceptions under the rule in Rylands v. Fletcher. The enterprise alone had the resources to discover and guard against hazards or dangers, and to provide warning against potential hazards. In conclusion, the aforesaid 133 containers were directed to be expeditiously destroyed by incineration, as per the recommendations of the Monitoring Committee. The cost of incineration had to be covered by the importers.

The principles laid down in this case form the law regarding hazardous waste management in the country.

THE NEED FOR ADOPTING AN INTEGRATED APPROACH TOWARDS CHEMICAL AND HAZARDOUS WASTE MANAGEMENT

The growing consumer base for chemicals has further contributed to increasing chemical and hazardous waste, thus taking the scope of handling such waste outside the directive and non-directive approaches (which focus primarily on the industrial producers). It further calls for an integrated approach for the management of such

¹³ Rylands v. Fletcher, UKHL 1, (1868).

waste. An integrated approach includes the participation of all the stakeholders involved in the production, storage, transportation, handling and disposal of these hazardous wastes.

The concept of 'stakeholder approach' in general was first introduced by Freeman in 1984. He defined a stakeholder as "*Any group or individual who can affect or is affected by the achievement of the firm's objective.*"¹⁴ In chemical and hazardous waste generation activities, the stakeholders involved in the production, storage, transportation, handling, and even disposal processes must be considered. They are the manufacturers, consumers, workers, transporters, traders and recyclers, formal and informal. The involvement and participation of all these stakeholders is essential to achieve sustainability in waste management practices.

Countries like the United Kingdom have incorporated the stakeholder approach in their waste management policies.¹⁵ In India, considering the increase in hazardous waste consequent to the population explosion, as well as shrinking land availability for dumping, there is a revamped need for segregation, energy-from-waste generation, recycling, etc., through stakeholders. The traditional top-down approaches involving only the authorities, and ignoring the various stakeholders and their resources and roles, have escalated the waste mismanagement. With the replacement of this traditional approach with a stakeholder approach, the generated hazardous waste can be efficiently segregated at the source, properly stored, and transported for disposal or for recycling or treatment. The indiscriminate dumping in landfills and burning, which further aggravate the environmental degradation caused, can be arrested by roping in both the formal and informal stakeholders.

The stakeholder approach for chemical and hazardous waste management has financial and environmental benefits. With the effective handling of hazardous wastes through the stakeholder approach, all stakeholders stand to benefit. Such benefit will accrue from the availability of increased segregated waste, as opposed to tons of hazardous waste indiscriminately dumped in landfills and poisoning the environment. The waste generated at source, if properly segregated, provides an additional source of income for manufacturers from selling the same. With the availability of huge amounts of

¹⁴ Oliver Heidrich, et al, *Stakeholder analysis for industrial waste management systems*, 29 Waste Management 965, 966 (2008).

¹⁵ Department for Communities and Local Government, Planning for Sustainable Waste Management: Companion Guide to Planning Policy Statement 10 (2006), https://assets.publishing.service.gov.uk/ government/uploads/system/uploads/attachment_data/file/7780/150805.pdf.

segregated waste, traders who buy such waste can make more revenue by trading it with recyclers. This raises the potential for more business, employment and a higher demand for segregated waste, encouraging segregation of waste at source as a new norm. Eventually, the hazardous wastes that trickle down from these vast quantities can be safely dumped in landfills or otherwise properly disposed of easily. Other benefits include reduced disposal costs, reduced pollution, and the ability to redefine priorities and redirect strategies as a consequence.¹⁶ Thus, the stakeholder approach is a win-win situation for all concerned, including the Environment.

In 1996, the United Nations Environment Programme (UNEP) defined "integrated waste management" as a framework of reference for designing and implementing new waste management systems, and for analyzing and optimizing existing systems. The concept of "Integrated Sustainable Waste Management" (ISWM) is mainly concerned with the implementation of strategies that go beyond mere technical considerations, also including the social, financial, political, institutional, and economic dimensions of waste management. According to the concept of ISWM, participation of stakeholders is one of the three pillars of sustainability.

Stakeholders can improve the efficacy and efficiency of hazardous waste management by continuous interaction to bring improvement in the system, and active participation (as each stakeholder has a clear role to play). For instance, waste generators (consumers), considered as passive partners, have a major responsibility to segregate the hazardous waste from other types of waste at source, and properly dispose the waste as per regulations. The 'consumers category' is the largest category of stakeholders in waste services. They have a multi-faceted relationship with waste activities: as waste generators, receivers of information, and participators in mobilization for waste management and urban sanitation. Therefore, close cooperation is required between waste generators (consumers) and waste collectors to increase the coverage and effectiveness of the waste collection system.

The recycling and recovery of materials also depend on the cooperation of waste generators and waste collectors. Through their cooperation and coordination, segregated waste can be recycled and rare materials can be recovered, which will reduce the burden on the environment. For instance, informal and improper handling of electronic waste, a kind of hazardous waste, results in the major loss of scarce and valuable raw materials. Almost no rare earth minerals are extracted from informal

¹⁶ Rylands v. Fletcher, UKHL 1, (1868).

recycling, which puts more pressure on the limited natural and rare earth metals.¹⁷ It has been reported by the Global Monitor Report¹⁸ that, "e-products contain more than 60 elements from the periodic table". Therefore, proper segregation leading to appropriate recycling methods can ultimately lead to sustainability. Further, participation of recyclers is also very crucial. They are mainly involved in the business of disposal of various hazardous wastes. However, for their participation to be fruitful and fulfilling, they must be given training and know-how to deal with such waste. This know-how and technical training will lead to responsible recycling of hazardous wastes having less or zero impact on human health and environment, which will further lead to sustainable development.

Similarly, close cooperation between manufacturers and waste collectors can lead to proper handling of hazardous waste produced as a by-product of the manufacturer's production process. Manufacturers must handle it with care and ensure the environmentally sound management of that hazardous waste. Transporters must also ensure the safe transportation of any such hazardous waste so as to reduce any impact on the surrounding environment. Employees and workers should also understand their roles and responsibilities towards the safe and sound management of such hazardous waste. Consequently, to ensure the maintenance of optimal human health and safeguard the environment, it is crucial to build strategies to rope in all the stakeholders.

Therefore, to achieve sustainability in waste management, it is important to look at the roles, interests and power structures of stakeholders that exist in waste management. Experiences in several countries have shown that cooperation and coordination between different stakeholder groups have led to increased sustainability of a waste management system.

STAKEHOLDERS IN THE CHEMICAL SECTOR AND REGULATORY IMPACT

The legal regime in India spells out the roles and responsibilities of stakeholders through various legislations aimed at regulating specific industries. The responsibilities of stakeholders include their duty towards the environment and the public to minimize waste generation and to effectively handle and dispose off wastes.

¹⁷ Vanessa Gray, *Let's rethink e-waste, and pave the way to a waste-free economy for electronics*, ITU News (Jan. 01, 2019), https://news.itu.int/lets-rethink-e-waste-free-economy/.

¹⁸ BALDE ET AL., THE GLOBAL E-WASTE MONITOR 2017: QUANTITIES, FLOWS AND RESOURCES (2017), https://www.itu. int/en/ITU-D/Climate-Change/Documents/GEM%202017/Global-E-waste%20Monitor%202017%20. pdf.

The various responsibilities of different stakeholders with respect to chemical and hazardous waste management will be discussed in the following sections.

Manufacturers and Producers:

For industries involved in battery production, manufacturers are imposed with a responsibility under Rule 4 of Batteries (Management and Handling) Rules, 2001 as amended in 2010, for the safe handling of all stages of battery production. The manufacturer has to ensure that the used batteries are collected back, and are of similar type and specifications as the new batteries sold. For the collection of used batteries from consumers or dealers, manufacturers have to set up collection centers at various places, either individually or jointly. They have to promote recycling by buying only recycled lead from registered recyclers and affixing the international recycling sign on the batteries. The collected used batteries should be sent only to the registered recyclers and necessary arrangements should be made with dealers for safe transportation from collection centers to the premises of registered recyclers. Manufacturers and importers must also ensure that the new batteries shall be sold only to registered dealers.¹⁹ Any environmental damage during transportation should be prevented. Additionally, they are responsible to the public for creating public awareness through advertisements, publications, posters or by other means. Such awareness must be generated regarding the hazards of lead, the responsibility of consumers to return their used batteries only to the dealers or deliver at designated collection centers, and addresses of dealers and designated collection centers. To ensure compliance with the stated responsibility, the manufacturers have to file a half-yearly return of their sales and buy-back with the State Pollution Control Boards. They are also tasked with informing the State Pollution Control Boards or the Ministry of Environment, Forests and Climate Change of any violation by the dealers.

The Ozone Depleting Substances (Management and Control) Rules, 2000, as amended in 2019, direct manufacturers involved in the production of ozone depleting substances not to produce specified substances²⁰ including Aerosol products, polyol, and methyl bromide. If producing those prohibited substances, they have to register with the specified authority.²¹ The manufacturers have to ensure that they do not

¹⁹ Batteries (Management and Handling) Rules, 2001, Rule 4.

²⁰ Ozone Depleting Substances (Regulation and Control) Rules, 2000, Rule 3(1).

²¹ Id.

exceed the specified quantity for production.²² Unless registered with the competent authority, manufacturers cannot produce compressors.²³

In the electrical, electronic equipment and e-waste industry, the E-Waste (Management) Rules, 2016 impose certain obligations on manufacturers. Rule 4 requires the manufacturer to collect all the e-waste generated during the manufacture of any electrical and electronic equipment, and channelise it for recycling or disposal. They have to apply for an authorization from the concerned State Pollution Control Board, which shall give the same in accordance with the prescribed procedure. They also have to ensure that no damage is caused to the environment during the storage and transportation of e-waste. To track the generated e-waste, the manufacturers are to maintain records of the e-waste generated, handled and disposed, and make such records available for scrutiny by the concerned State Pollution Control Board.

In any industry where hazardous and other wastes are generated, the 'occupier' of such industries (a person in control of the industry or in possession of the waste)²⁴ is responsible for the generated waste in accordance with Rule 4 of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. Rule 4 mandates that the occupier should follow the steps of prevention, minimization, reuse, recycling, recovery, utilisation including co-processing, and safe disposal for the management of hazardous and other wastes. The occupier is responsible for safe and environmentally sound management of hazardous and other wastes. Any such waste generated should be sent or sold by the occupier to an authorised actual user, or shall be disposed of in an authorised disposal facility only. The transportation of hazardous waste from an occupier's establishment to such users/facilities should be in accordance with the provisions of these rules. In the event of treatment and disposal, specific information needed for safe storage and disposal of hazardous waste must be given by the occupier to the operator of a treatment, storage and disposal facility. Most importantly, while managing hazardous waste, the occupier should take all the necessary steps to contain contaminants, prevent accidents, and limit their consequences on human beings and the environment; and provide persons working in the site with appropriate training, equipment, and the information necessary to ensure their safety.

²² Id. Rule 3(2).

²³ Id. Rule 12.

²⁴ Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016, Rule 3(21).

In any industrial activity involving the manufacture, storage and import of Hazardous Chemicals, 'The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989' affix responsibility on the occupier. Rule 4 lays down the general responsibility of the occupier during industrial activity. It extends the application of these Rules to an industrial activity currently or potentially involving a hazardous chemical, or the isolated storage of a hazardous chemical, in a quantity equal to or more than the specified threshold quantity. The occupier of such industrial activity should provide evidence to show the identification of major accident hazards. The evidence should also include that of adequate steps being taken to prevent such major accidents, and to limit their consequences to persons and the environment. Further, the occupier must provide to the persons working on the site with information, training and equipment, including antidotes necessary to ensure their safety. Further, before commencing the activity, the occupier has to prepare and send to the concerned authority a safety report on the industrial activity ²⁵ and take steps to inform the persons concerned about such activity.²⁶ In the event of any major accident occurring on a site or in a pipeline, the occupier should inform the concerned authority within 48 hours of that accident, and if necessary, furnish a report relating to the accident in installments.²⁷ Additionally, the occupier should notify the concerned Authority of the steps taken to avoid any repetition of such occurrence on a site.²⁸ The occupier's responsibility towards the public includes taking appropriate steps to inform persons outside the site, and in an area prone to a major accident, about the nature of the major accident hazard, the safety measures, and the "Do's" and "Don'ts" which should be adopted in the event of a major accident. Such information should be conveyed either directly or through a District Emergency authority.²⁹

The manufacturers engaged in the production of disposable products (such as plastics packaging, tin etc.) have certain obligations under the Solid Waste Management Rules, 2016. They must provide necessary financial assistance to local authorities for the establishment of a waste management system.³⁰ Additionally, they have to put in place a system to collect back the non-biodegradable packaging waste

- 28 *Id.* Rule 5(3).
- 29 Id. Rule 5(1).

²⁵ Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, Rule 10.

²⁶ *Id.* Rule 15(2).

²⁷ Id. Rule 5.

³⁰ Solid Waste Management Rules, 2016, Rule 17(1).
generated from their production.³¹ Manufacturers of sanitary napkins and diapers should explore the possibility of using recyclable materials in their products, or provide a pouch or wrapper for the disposal of each napkin or diaper.³² They are also responsible for educating the masses for wrapping and disposing their products.³³

Any producer/manufacturer/ other organisation producing radioactive waste must get authorisation under the Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987. They are responsible to dispose the radioactive waste only in the specified quantities, and in the location specified in the authorisation.³⁴ The authorised person should maintain a record of the disposal of radioactive waste, containing particulars as to: (a) the description, quantity, physical state, chemical characteristics, and the date of disposal of each consignment of radioactive waste; (b) the mode of disposal; (c) the concentration of radioactive material in the waste disposed of, and in the site of disposal; (d) names of the workers and the Radiological Safety Officer associated with the disposal of the radioactive waste; (e) data on periodic radiation surveillance in and around the site of the disposal, as specified in the authorisation.³⁵

Countries are experimenting with a novel concept of Extended Producer Responsibility (EPR). Under this policy approach, producers are given a significant responsibility, either financial and/or physical, for the treatment or disposal of post-consumer products.³⁶ This approach could provide incentives to prevent wastes at the source, promote product design for the environment, and support the achievement of public recycling and material management goals.³⁷ India has adopted this approach in plastic manufacturing industries through the Plastic Waste Management Rules, 2016. It has defined "extended producer's responsibility" as the responsibility of a producer for the environmentally sound management of the product until the end of its life.³⁸ Similarly, the E-Waste (Management) Rules, 2016 also incorporate this principle.

³¹ Id. Rule 17(2).

³² *Id.* Rule 17(3).

³³ Id. Rule 17(4).

³⁴ Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987, Rule 3.

³⁵ *Id.* Rule 7.

³⁶ *Extended producer Responsibility*, OECD, https://www.oecd.org/env/tools-evaluation/extended producerresponsibility.htm (last visited June 09, 2020).

³⁷ Id.

³⁸ Plastic Waste Management Rules, 2016, Rule 3(h).

The Plastic Waste Management Rules, 2016 impose a responsibility on manufacturers of plastic to efficiently manage the generated plastic waste. Rule 9 imposes a responsibility on manufactures and producers to work out the modalities for the waste collection system based on Extended Producers Responsibility. Such systems must involve State Urban Development Departments, either individually or collectively, through their own distribution channel or through the local body concerned. It is the primary responsibility of the producers, or whoever introduces the plastic products in the market, to collect the plastic waste generated due to their products through a system. Further, this plan of collection should be submitted to the State Pollution Control Boards while applying for Consent to Establish or Operate or Renewal. No producer or manufacturer can engage in the production of plastic products without registration, and they are responsible to phase out the manufacture and use of multi-layered plastic which is non-recyclable or non-energy recoverable or with no alternate use within two years.³⁹ Every producer should maintain a record of details of the person engaged in the supply of plastic used as raw material to manufacture carry bags or plastic sheet or the likes or cover made of plastic sheet or multilayered packaging.40

The producers of electrical and electronic equipment have been imposed with Extended Producers Responsibility upon authorisation under Rule 5 of the E-Waste (Management) Rules 2016. They are responsible for the collection and channelisation of e-waste generated from the 'end-of-life' of their products or 'end-of-life' products with the same electrical and electronic equipment code and historical waste. In cases of fluorescent and other mercury containing lamps, where recyclers are not available, channelisation may be from a collection centre to a Treatment, Storage and Disposal Facility. Before disposal in the facility, pre-treatment is necessary to immobilise the mercury and reduce the volume of waste. Further, they are responsible to create awareness through media, publications or by any other means of communication and product user documentation accompanying the equipment, with regard to:

- i. contact information, toll-free telephone numbers or helpline numbers;
- ii. information on hazardous constituents in electrical and electronic equipment;
- iii. information on hazards of improper handling, disposal, accidental breakage, damage or improper recycling of e-waste;

³⁹ Id. Rules 3(h) & 9(5).

⁴⁰ *Id.* Rule 9(6).

- iv. instructions for handling and disposal of the equipment after its use, along with the Do's and Don'ts;
- v. affixing a visible, legible and indelible symbol on the products or product user documentation to prevent e-waste from being dropped in garbage bins containing waste destined for disposal;
- vi. means and mechanisms available for consumers to return e-waste for recycling, including the details of Deposit Refund Scheme, if applicable.

The producer should also maintain records of the e-waste handled, and make them available for scrutiny by the Central Pollution Control Board or the concerned State Pollution Control Board. They are also responsible to file annual returns. Any operation without Extended Producer Responsibility authorisation by any producer is considered as causing damage to the environment. Further, the import of electrical and electronic equipment is allowed only to producers having Extended Producer Responsibilities of the manufacturer to collect e-waste generated during the manufacture of any electrical and electronic equipment, and channelise it for recycling or disposal. Further, manufacturers have to ensure that no damage is caused to the environment during storage and transportation of e-waste. Similar to producers, they have to file annual returns and maintain records of the e-waste generated, handled and disposed, and make them available for scrutiny by the concerned State Pollution Control Board.

Importers and Exporters

The importers of hazardous and other waste bear various obligations under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. They have to apply for the requisite permit with the Ministry of Environment, Forest and Climate Change, and secure the prior informed consent of the exporting country.⁴¹ No such consent is required for the import of other wastes, however, the customs authorities should be furnished with the prescribed information.⁴² The importer is also responsible to maintain records of the hazardous

⁴¹ Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Rule 13.

⁴² *Id.* Rule 13(2).

and other waste imported by him, and make it available for inspection.⁴³ The importer, like the producer, should also file annual return with the State Pollution Control Board.⁴⁴ Similar responsibility is placed on exporters under these Rules.

The importers of plastic products have been vested with obligations under the Plastics Waste Management Rules, 2016. When they introduce a multi-layered plastic product in the market, they are primarily responsible for the collection of plastic waste generated due to their products through a collection system.⁴⁵ This plan of collection should be submitted to the State Pollution Control Boards while applying for the Consent to Establish or Operate or Renewal.⁴⁶ Further, they are responsible for preventing the entry of unauthorized persons in the restricted areas containing the radioactive waste.⁴⁷

The importer importing hazardous chemicals is responsible under Rule 18 of the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 to furnish details on certain points to the concerned authorities before the date of import. These include the contact information of receiver in India, the port of entry, the mode of transport from the exporting country, the quantity of chemical(s) being imported, and complete product safety information. Further, the importer should maintain records of the hazardous chemicals imported and make them available for inspection.

Consumers

Consumers, by virtue of being waste generators, become an important stakeholder in the waste management practice. The responsibility is extended to them under various legislations to efficiently handle the generated waste. The consumers of batteries are responsible under the Batteries (Management and Handling) Rules, 2001 to ensure that used batteries are disposed through deposit with prescribed stakeholders. These stakeholders are the dealer, manufacturer, importer, assembler, registered recycler, re-conditioner, or the designated collection centers.⁴⁸ However, bulk consumers or their user units are allowed to auction used batteries, but only to registered recyclers.⁴⁹

48 Batteries (Management and Handling) Rules, 2001, Rule 10(1).

⁴³ Id. Rule 13(7).

⁴⁴ *Id.* Rule 13(8).

⁴⁵ Plastic Waste Management Rules, 2016, Rule 9(2).

⁴⁶ Id.

⁴⁷ Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987, Rule 9.

⁴⁹ *Id.* Rule 10(2).

The E-Waste (Management) Rules, 2016 make the consumers of electrical and electronic equipment responsible for the e-waste generated. Consumers or bulk consumers should ensure that e-waste generated by them is channelised through the collection center, or the dealer of the authorised producer, or the dismantler, or the recycler, or through the designated take-back service provider of the producer to the authorised dismantler or recycler.⁵⁰ Consumers or bulk consumers also have to ensure that such end-of-life electrical and electronic equipment are not admixed with e-waste containing radioactive material, as covered under the Atomic Energy Act, 1962 and Rules made thereunder.⁵¹ Special responsibilities are cast on bulk consumers, such as - (a) maintaining records of e-waste generated by them; (b) making such records available for scrutiny by the concerned State Pollution Control Board;⁵² and (c) filing annual returns with the concerned State Pollution Control Board.⁵³

Consumers are also responsible for the solid waste generated by them under The Solid Waste Management Rules, 2016. Consumers are mandated to segregate and store the waste generated by them in suitable bins in three separate streams, namely bio-degradable, non-biodegradable, and domestic hazardous wastes. Further, they must handover segregated wastes to authorised waste pickers or waste collectors.⁵⁴ Further, they must wrap securely the used sanitary waste like diapers, sanitary pads etc., in the pouches provided in the products, or in a suitable wrapping material as instructed by the local authorities. These must be disposed in the bin meant for dry waste or non- bio-degradable waste.⁵⁵ Consumers generating construction and demolition waste should store them separately in their own premises, and dispose them off as per the Construction and Demolition Waste Management Rules, 2016.⁵⁶ Similarly, horticulture waste and garden waste generated from their premises are to be stored separately in their own premises, and disposed off as per the directions of the local body.⁵⁷ Consumers are prohibited from throwing, burning, or burying the solid waste generated by them on streets, open public spaces outside their premises,

53 Id. Rule 9(4).

- 55 Id. Rule 4(1)(b).
- 56 *Id.* Rule 4(1)(c).
- 57 *Id.* Rule 4(1)(d).

⁵⁰ E-Waste (Management) Rules, 2016, Rule 9(1).

⁵¹ *Id.* Rule 9(3).

⁵² *Id.* Rule 9(2).

⁵⁴ Solid Waste Management Rules, 2016, Rule 4(1)(a).

or in the drain or water bodies.⁵⁸ Additionally, consumers also have to pay the user fee for solid waste management.⁵⁹ Moreover, a consumer who is an organiser of any event or gathering of more than one hundred persons at any unlicensed place has to intimate the local body three days in advance. Further, they have to ensure the segregation of generated waste at source, and handing over of segregated waste to waste collector or agency.⁶⁰

Consumers of plastic products, as waste generators, bear obligations under the Plastic Waste Management Rules, 2016. These include minimizing the generation of plastic waste, and segregation at source.⁶¹ They should also avoid the littering of plastic waste, and hand over the segregated waste to the urban local body/Gram Panchayat/ any other agencies appointed by them, or to registered waste pickers, or to registered recyclers or waste collection agencies. Similarly, institutional generators of plastic waste should segregate and store the waste generated by them in accordance with the Municipal Solid Waste (Management and Handling) Rules, 2000. They should further handover the segregated wastes to authorized waste processing or disposal facilities or deposition centres, either on their own or through the authorized waste collection.⁶³ The consumer organizing an event in open space, which involves the service of foodstuff in plastic or multi-layered packaging, should segregate and manage the waste generated during such events in accordance with the Municipal Solid Waste (Management and Handling) Rules, 2000.⁶⁴

Transporters and drivers

The transporters of hazardous chemical bear an important obligation under Rule 18(6) of the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989. They must ensure that the transport of hazardous chemicals from the port of entry to the ultimate destination is in accordance with the Central Motor Vehicles Rules, 1989.

- 62 *Id.* Rule 8(2).
- 63 Id. Rule 8(3).
- 64 Id. Rule 8(4).

⁵⁸ *Id.* Rule 4(2).

⁵⁹ *Id.* Rule 4(3).

⁶⁰ Id. Rule 4(5).

⁶¹ Plastic Waste Management Rules, 2016, Rule 8.

Under the Central Motor Vehicle Rules, 1989, it is the responsibility of the transporters of any dangerous or hazardous goods to ensure that (a) the goods carriage has a valid registration to carry the said goods, and is safe for its transport; (b) the same is equipped with necessary first-aid, safety equipment, tool box, and antidotes necessary to contain any accident.⁶⁵ Before undertaking the transportation, the transporter must be satisfied that the information given by the consignor is full and accurate in all respects, and corresponds to the classification of such goods specified in Rule 137 of Motor Vehicle Rules.⁶⁶ The transporter is also responsible for providing relevant information in writing to the driver of such carriage. They must satisfy themselves that such driver has sufficient understanding of the nature of such goods and the nature of the risks involved in the transport of such goods. The driver must further be capable of taking appropriate action in case of an emergency.⁶⁷ The transporter should also ensure that the driver holds a valid driving license.⁶⁸ The transporter and consignor of such goods should lay down the route for each trip, and fix a timetable for each trip, to the destination and back.⁶⁹ Under these Rules, the driver of a goods carriage transporting dangerous or hazardous goods is also responsible for ensuring that the information given to him in writing by the transporter is kept in the driver's cabin, and is available at all time during transportation.⁷⁰ Further, the driver has to observe all the directions necessary for preventing fire, explosion, or escape of dangerous or hazardous goods when in motion. When the goods carriage is not being driven, it should be parked in a place that is safe from fire, explosion and any other risk. At all times, the vehicle remains under the control and supervision of the driver, or some other competent person above the age of 18 years.⁷¹

The transporters of e-waste are responsible under E-Waste (Management) Rules, 2016 to carry a document (three copies) prepared by the sender, giving the specified details.⁷² However, the transportation of waste generated from manufacturing or recycling, and destined for final disposal to a Treatment, Storage and Disposal

68 Id. Rule 132(5).

- 70 *Id.* Rule 133(1).
- 71 *Id.* Rule 133(2).

⁶⁵ Central Motor Vehicle Rules, 1989, Rule 132(1).

⁶⁶ *Id.* Rule 132(2).

⁶⁷ *Id.* Rule 132(3).

⁶⁹ *Id.* Rule 132(4).

⁷² E-Waste (Management) Rules, 2016, Rule 19(1).

facility, have to be done as per the Hazardous Wastes and Other Wastes (Management and Transboundary Movement) Rules, 2016.⁷³ Where an accident occurs during transportation of e-waste, the transporter shall report about the same immediately to the concerned State Pollution Control Board, through telephone and e-mail.⁷⁴ The transporter is also liable for all damages caused to the environment or third party due to improper handling and management of the e-waste. They must also pay financial penalties, as levied, for any violation of the provisions under these rules.⁷⁵

The transporter of hazardous and other wastes has been vested with responsibilities under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. They are responsible for its transportation in accordance with the provisions of these rules, the rules made by the Central Government under the Motor Vehicles Act, 1988, and the guidelines issued by the Central Pollution Control Board.⁷⁶ In case of transportation for final disposal to a facility in a state different from the place of generation of the waste, the sender (transporter) should obtain a 'No Objection Certificate' from the State Pollution Control Boards of both the states.⁷⁷ In case of the transportation of hazardous and other waste to another state for recycling or utilization (including co-processing), both the State Pollution Control Boards should be intimated by the sender before handing over the waste to the transporter.⁷⁸ In case of transit of hazardous and other waste for recycling, utilization (including co-processing), or disposal through a state other than the states of origin and destination, the sender should give prior intimation to the concerned State Pollution Control Board of the state(s) of transit before handing over the wastes to the transporter.⁷⁹ The Rules impose the responsibility of safe transportation on either the sender or the receiver.⁸⁰ The authorisation for transportation should be obtained either by the sender or the receiver on whose behalf the transport is being arranged.⁸¹ If an accident occurs during transportation, the transporter should

- 77 Id. Rule 18(3).
- 78 Id. Rule 18(4).
- 79 Id. Rule 18(5).
- 80 *Id.* Rule 18(6).
- 81 Id. Rule 18(7).

⁷³ Id.

⁷⁴ Id. Rule 20.

⁷⁵ *Id.* Rule 21.

⁷⁶ Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Rule 18(1).

immediately intimate the State Pollution Control Board by telephone or e-mail about the accident, and subsequently send a report in the prescribed form.⁸²

Traders and Dealers

Traders in the context of Batteries (Management and Handling) Rules, 2001 are referred to as dealers, by the nature of its definition.⁸³ The dealer is responsible to ensure that the used batteries are collected back against the new batteries sold, and to give appropriate discount for every used battery returned by the consumer.⁸⁴ They have to ensure that the used batteries collected back are of a similar type and specifications as the new batteries sold. Further, they must safely transport collected batteries to the designated collection centers, or to the registered recyclers.⁸⁵ It is also their responsibility to ensure that no damage is caused to the environment during the storage and transportation of used batteries.⁸⁶

Similarly, dealers collecting e-waste have certain responsibilities under E-Waste (Management) Rules, 2016. They are required to collect the e-waste by providing the consumer with a box, bin, or a demarcated area to deposit e-waste, or through a take back system. They must send the e-waste so collected to the collection center or dismantler or recycler, as designated by the producer.⁸⁷ If the e-waste is collected through the take back system, the dealer should refund the amount to the depositor of e-waste as per the take back system or Deposit Refund Scheme of the producer.⁸⁸ The dealers should ensure that the generated e-waste is safely transported to authorised dismantlers or recyclers.⁸⁹ They also have to ensure that no damage is caused to the environment during the storage and transportation of e-waste.⁹⁰

86 Id.

- 89 *Id.* Rule 7(3).
- 90 *Id.* Rule 7(4).

⁸² Id. Rule 18(22).

⁸³ Batteries (Management and Handling) Rules, 2001, Rule 3(i) (defining 'Dealer' as "a person who sells and receives lead acid batteries or components thereof to and from the consumers or other dealers or retailers on behalf of the manufacturers, importers, assemblers and re-conditioners or otherwise").

⁸⁴ *Id.* Rule 7.

⁸⁵ Id.

⁸⁷ E-Waste (Management) Rules, 2016 Rule 7(1).

⁸⁸ Id. Rule 7(2).

Recyclers

Recyclers of batteries, under the Batteries (Management and Handling) Rules, 2001, have to apply for registration to the Ministry of Environment and Forests. They further have to ensure strict compliance with the terms and conditions of registration.⁹¹ If Lead is recovered by reprocessing, the recycler has to mark 'Recycled' on the Lead.⁹² They are also responsible to the public for creating public awareness through advertisements, publications, posters, or others means. Such awareness must be generated regarding - (a) the hazards of Lead; and (b) the obligation of consumers to return used batteries only to the registered dealers, or deliver them at the designated collection centres.⁹³ Further, to verify compliance with the rules, they have to submit for inspection annual returns as per Form VII and all records relating to receipt of used batteries, sources, quantities, and metal yield to the State Pollution Control Board for inspection.⁹⁴

The recyclers of e-waste are also bound under Rule 11 of the E-waste (Management) Rules, 2016 to ensure that the facility and recycling processes are in accordance with the prescribed standards or guidelines.⁹⁵ They are also responsible to prevent environmental damage during the storage and transportation of e-waste,⁹⁶ and to ensure that the recycling processes do not have any adverse effect on health and the environment.⁹⁷Any recycling process without authorisation is considered to be causing environmental damage under these Rules.⁹⁸ If any fractions or material is not recycled in recycler's facility, the same has to be sent to the respective authorised recyclers.⁹⁹ Similarly, the residue generated during the recycling process should be disposed of in an authorised treatment storage disposal facility.¹⁰⁰ Additionally, recyclers can accept non- radioactive waste, electrical and electronic equipment, or components not listed in Schedule I for recycling, and inform the State Pollution

- 98 Id. Rule 11(11).
- 99 *Id.* Rule 11(6).

⁹¹ Batteries (Management and Handling) Rules, 2001, Rule 8.

⁹² Id.

⁹³ Id.

⁹⁴ Id.

⁹⁵ E-Waste (Management) Rules, 2016, Rule 11(1).

⁹⁶ Id. Rule 11(3).

⁹⁷ *Id.* Rule 11(4).

¹⁰⁰ Id. Rule 11(7).

Control Board when taking authorisation.¹⁰¹ To secure compliance with the Rules, the recycler has to maintain and make available for scrutiny the records of e-waste collected, dismantled, recycled and sent to authorised recycler. They have to file annual returns to the concerned State Pollution Control Board.¹⁰²

REGULATORS

In India, the authorities in charge of implementing these various environmental laws are the Central Pollution Control Board and the State Pollution Control Boards. These boards were set up under the provisions of the Water (Prevention and Control of Pollution) Act, 1974. They have been given various functions and powers under the various environmental laws and regulations.

a. Functions of Central Pollution Control Board

- i. To advise the Central Government
- ii. To co-ordinate with State Boards
- iii. To provide technical guidance to the State Boards
- iv. To organize training programmes
- v. To publish statistical data

b. Powers of Central Pollution Control Board

- i. Power to give directions to the State Boards
- ii. Power to issue directions to the closure, prohibition or regulation of any industry, operation or process.

c. Functions of State Pollution Control Boards

- i. To advise the State Governments
- ii. To disseminate information for preventing pollution
- iii. To conduct investigation and research
- iv. To provide licenses to plants etc. to operate

¹⁰¹ *Id.* Rule 11(10).

¹⁰² Id. Rule 11(7) & (8).

d. Powers of the Central Pollution Control Boards

- i. Power to obtain information
- ii. Power of entry and inspection
- iii. Power to cancel licenses
- iv. Power to give directions

From the powers and functions of the two bodies, it is clear that they are charged with operating as both administrative and quasi-judicial bodies.

With regards to the Boards' powers to inspect and collect samples of bodies, the Courts have mandated strict compliance with the procedures laid down under the parent Act giving such power. For instance, the Delhi High Court, in *Delhi Bottling Co. Pvt. Ltd. v. CBPC*,¹⁰³ was charged with finding whether a sample collected by the Pollution Control Board could be admitted as evidence. The Court held that the sample could not be regarded as evidence since it had not been collected while following the procedure laid down under the Water (Prevention and Control of Pollution) Act, 1974.

Furthermore, the Courts have repeatedly held that the power to cancel licenses and any permission granted under the Act is a quasi-judicial function of the authority. Hence, the Board will need to comply with principles of natural justice, and also record reasons in writing to cancel any license. In *ORYX Fisheries Private Limited v. Union of India (UOI) and Ors.*,¹⁰⁴ the Supreme Court reiterated that, "*It is well settled that a quasi-judicial authority, while acting in exercise of its statutory power must act fairly and must act with an open mind while initiating a show cause proceeding. A show cause proceeding is meant to give the person proceeded against a reasonable opportunity of making his objection against the proposed charges indicated in the notice."*

Thus, it is apparent that the Boards are conferred with immense power and responsibilities for implementing the various environmental laws. However, there is an obligation on them to exercise these powers in compliance with the procedures laid down under the laws.

¹⁰³ Delhi Bottling Co. Pvt. Ltd. v. CBPC, AIR 1986 Delhi 152.

¹⁰⁴ ORYX Fisheries Private Limited v. Union of India (UOI) and Ors, (2010) 13 SCC 427.

CONCLUSION

The ever mounting challenges in management and handling of chemical and hazardous waste in India requires an integrated approach with the directive and non-directive approaches to the chemical sector. Currently, the stakeholders and authorities, along with their functions are authorised under numerous legislations handling different chemicals resulting in hurdles to effective enforcement. Moreover, the legislative provisions are limited to the basic key stakeholders in the chemical sector. This essentially leaves out of its regulatory scope various stakeholders, especially the smallscale rag pickers and traders in scrap or electronic parts. A pragmatic solution would be to identify all the relevant stakeholders in each chemical industry and include them within the ambit of the existing legislations. Further, strengthening enforcement and securing active stakeholder participation at every stage of chemical handling through incentives and timely regulation would be necessary. A stakeholder-driven model with frequent engagement of the stakeholders through meetings can aid in the better management of chemical and hazardous waste. This will ensure a streamlined and a smooth transition to the stakeholder approach from our traditional approach. Apart from consumer-focused public awareness on the harmful effects and adoption of best practices towards handling chemicals or its wastes, a stakeholder-focused approach is required to instill in them the seriousness of the roles that they play and their ultimate responsibility to the environment.

CHAPTER 2

IMPORT AND EXPORT OF CHEMICALS AND INTERNATIONAL CHEMICAL TRADE

INTRODUCTION

Over time, the recycling and recovery of waste has led to the emergence of a global industry. This is especially true for developing countries, which are able to increase both trade and their Gross Domestic Product by engaging in this activity. Various important techniques have been developed worldwide in respect of hazardous waste and chemical treatment. States prefer to outsource the recycling of their waste owing to the high cost of waste treatment, leading to ever-increasing transfer of waste, India emerged as a breeding ground for the hazardous waste and chemical industry. The present chapter, examines the manner in which the imports of hazardous waste and chemicals into India are regulated.

Developed countries have strict environmental norms that place tight restrictions and necessitate high costs on the domestic disposal of hazardous wastes in an environmentally-sound manner. Consequently, the cost of production rises to unsustainable levels that make it difficult to take into account the cost of waste disposal, which lead the industrial sectors of developed countries to ship such wastes to third world countries at lower costs. The third world countries have neither the infrastructure nor stringent regulations to deal with such imports. Investigations by environmental groups like Green Peace and Toxic Links reveal that waste traders export huge quantities of hazardous wastes to India due to its low environmental standards and lack of enforcement of laws.¹

ENVIRONMENTAL IMPACT OF HAZARDOUS WASTES AND CHEMICALS

Hazardous wastes pose a severe risk to human health and to various components of the environment, viz. soil, air, and water. Environment protection issues are

¹ RESEARCH UNIT (LARRDIS), RAJYA SABHA SECRETARIAT, E-WASTE IN INDIA (2011), https://rajyasabha.nic.in/ rsnew/publication_electronic/E-Waste_in_india.pdf; See also Rimjhim Jain, Laying India to waste, DownToEARTH (Apr. 15, 1995), https://www.downtoearth.org.in/news/laying-india-to-waste-27783.

emerging as a significant challenge when it comes to the management and handling of hazardous waste and chemicals.

The operations of a company are subject to various government regulations, including those pertaining to environmental protection. These laws and regulations stipulate higher environmental protection standards pertaining to air emissions; the use, handling and transport of hazardous or toxic materials; waste water storage; treatment and discharges; waste disposal practices as well as the remediation of environmental contamination. Complying with these regulations adds new costs for the company, which could affect its operational performance. If the company fails to comply with these regulations, it may be penalized with hefty fines and penalties, which could have a material impact on its profitability. It may also be denied new projects, which might hamper its business prospects.

Despite these regulations, the environmental impact of these hazardous waste and chemicals continues to be a major concern. Some reasons are-

- Inefficient storage- The storage of industrial solid waste is often one of the most neglected areas of operation in an industry. Little attention is paid to proper storage. Loads of mixed waste stacked against a wall, or on open ground, has become a common sight in many factories. Concrete bays or disused drums are also often used for storage.
- 2. Transportation of hazardous waste- The transportation of such wastes in developing countries is generally done by open trucks, instead of purpose-built vehicles. The wastes are not covered during transportation. Further, instead of special arrangements being made for the collection of such hazardous wastes, they are collected together with the other wastes. Besides, since the contractors who carry hazardous waste do not need to be licensed, there is little control over the types of firms engaged in carrying hazardous waste and the vehicles used to transport such waste.

MAJOR ACTORS IN THE CHEMICALS AND HAZARDOUS WASTES INDUSTRY

Chemicals are one of the most widely used materials in the world, finding application in almost all manufacturing sectors. With the increase in industrial activity, the demand for chemicals also increased, resulting in higher international trade. However, despite a growth in the domestic manufacturing capacity of chemicals, India remained a net importer. This is because capacity addition lagged demand growth, and certain chemical imports were cheaper than products produced within the country. Used oil, battery wastes, and non-ferrous wastes such as lead and zinc are commonly recycled in India.² The Indian chemical industry is comprised of both small and large-scale companies, with about 65,000 – 70,000 small chemical manufactures across the country. Some of the major chemical manufacturers in India are - Tata Chemicals Ltd., UPL Ltd., India Glycols Ltd. (IGL), BASF India and Phillips Carbon Ltd. The below Table 1 showcases the range of processes and industries that generate hazardous waste, as well as the nature of the hazardous waste produced³:

Sl. No.	Processes	Hazardous Waste	
1.	Petrochemical processes and pyrolytic operations	 1.1 Furnace or reactor residue and debris 1.2 Tarry residues and still bottoms from distillation 1.3 Oily sludge emulsion 1.4 Organic residues 1.5 Residues from alkali wash of fuels 1.6 Spent catalyst and molecular sieves 1.7 Oil from wastewater 	
2.	Crude oil and natural gas production	 Drill cuttings excluding those from water- based mud Sludge containing oil Drilling mud containing oil 	
3.	Cleaning, emptying and maintenance of petroleum oil storage tanks including ships	 Cargo residue, washing water and sludge containing oil Cargo residue and sludge containing chemicals Sludge and filters contaminated with oil Ballast water containing oil from ships 	
4.	Petroleum refining or re- processing of used oil or recycling of waste oil	 1.1 Oil sludge or emulsion 1.2 Spent catalyst 1.3 Slop oil 1.4 Organic residue from processes 1.5 Spent clay containing oil 	

TABLE	1
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² Shantanu Dutta et al, *Environmental Management of Industrial Hazardous Wastes in India*, 48(2) J. ENV'T. Sci. & ENGG. 143, 148 (2006).

³ Data taken from Hazardous Waste Management Rules, 2016, Sch. I; Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, March 22, 1989, 1673 U.N.T.S. 126.

5.	Industrial operations using mineral or synthetic oil as lubricant in hydraulic systems or other applications	1.1 1.2 1.3	Used or spent oil Wastes or residues containing oil Waste cutting oils
6.	Secondary production and / or industrial use of zinc	1.1 1.2 1.3 1.4	Sludge and filter press cake arising out of production of Zinc Sulphate and other Zinc compounds. Zinc fines or dust or ash or skimmings in dispersible form Other residues from processing of zinc ash or skimmings Flue gas dust and other particulates
7.	Primary production of zinc or lead or copper and other non-ferrous metals except aluminum	1.1 1.2 1.3 1.4 1.5	Flue gas dust from roasting Process residues Arsenic-bearing sludge Non-ferrous metal bearing sludge and residue. Sludge from scrubbers
8.	Secondary production of copper	1.1 1.2 1.3	Spent electrolytic solutions Sludge and filter cakes Flue gas dust and other particulates
9.	Secondary production of lead	1.1 1.2 1.3	Lead bearing residues Lead ash or particulate from flue gas Acid from used batteries
10.	Production and/or industrial use of cadmium and arsenic and their compounds	1.1	Residues containing cadmium and arsenic
11.	Production of Primary and Secondary aluminum	1.1 1.2 1.3 1.4 1.5	Sludges from off-gas treatment Cathode residues including pot lining wastes Tar containing wastes Flue gas dust and other particulates Drosses and waste from treatment of salt sludge
12.	Metal surface treatment, such as etch- ing, staining, polishing, galvanizing, cleaning, degreasing, plating, etc.	1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8	Acidic and alkaline residues Spent acid and alkali Spent bath and sludge containing sulphide, cyanide and toxic metals Sludge from bath containing organic solvents Phosphate sludge Sludge from staining bath Copper etching residues Plating metal sludge

13.	Production of iron and steel including other ferrous alloys (electric furnace; steel rolling and finishing mills; Coke oven and by-products plant)	1.1 1.2 1.3 1.4 1.5 1.6	Spent pickling liquor Sludge from acid recovery unit Benzol acid sludge Decanter tank tar sludge Tar storage tank residue Residues from coke oven by-product plant.
14.	Hardening of steel	1.1 1.2	Cyanide-, nitrate-, or nitrite-containing sludge Spent hardening salt
15.	Production of asbestos or asbestos-con- taining materials	1.1 1.2 1.3	Asbestos-containing residues Discarded asbestos Dust or particulates from exhaust gas treatment.
16.	Production of caustic soda and chlorine	1.1 1.2 1.3	Mercury bearing sludge generated from mercury cell process Residue or sludges and filter cakes Brine sludge
17.	Production of mineral acids	1.1 1.2	Process acidic residue, filter cake, dust Spent catalyst
18.	Production of nitrogenous and complex fertilizers	1.1 1.2 1.3 1.4	Spent catalyst Carbon residue Sludge or residue containing arsenic Chromium sludge from water cooling tower
19.	Production of phenol	1.1 1.2	Residue or sludge containing phenol Spent catalyst
20.	Production and/or industrial use of solvents	1.1 1.2 1.3 1.4	Contaminated aromatic, aliphatic or naphthenic solvents may or may not be fit for reuse. Spent solvents Distillation residues Process Sludge
21.	Production and/or industrial use of paints, pigments, lacquers, varnishes and inks	1.1 1.2	Process wastes, residues and sludges Spent solvent
22.	Production of plastics	1.1 1.2	Spent catalysts Process residues
23.	Production and/or industrial use of glues, organic cements, adhesives and resins	1.1 1.2	Wastes or residues (not made with vegetable or animal materials) Spent solvents
24.	Production of canvas and textiles	1.1	Chemical residues

25.	Industrial production and formulation of wood preservatives	1.1 1.2	Chemical residues Residues from wood alkali bath
26.	Production or industrial use of synthetic dyes, dye-intermediates and pigments	1.1 1.2 1.3 1.4 1.5	Process waste sludge/residues containing acid, toxic metals, organic compounds Dust from air filtration system Spent acid Spent solvent Spent catalyst
27.	Production of organic-silicone compound	1.1	Process residues
28.	Production/formulation of drugs/ pharmaceutical and health care product	1.1 1.2 1.3 1.4 1.5 1.6	Process Residue and wastes Spent catalyst Spent carbon Off specification products Date-expired products Spent solvents
29.	Production, and formulation of pesticides including stock-piles	1.1 1.2 1.3 1.4 1.5 1.6	Process wastes or residues Sludge containing residual pesticides Date-expired and off-specification pesticides Spent solvents Spent catalysts Spent acids
30.	Leather tanneries	1.1	Chromium bearing residue and sludge
31.	Electronic Industry	1.1 1.2	Process residue and wastes Spent etching chemicals and solvents
32.	Pulp and Paper Industry	1.1 1.2 1.3	Spent chemicals Corrosive wastes arising from use of strong acid and bases Process sludge containing absorbable organic halides (AO _x)
33.	Handling of hazardous chemicals and wastes	1.1 1.2	Empty barrels/containers/liners contaminated with hazardous chemicals / wastes Contaminated cotton rags or other cleaning materials
34.	De-contamination of barrels/ containers used for handling of hazardous wastes/ chemicals	1.1 1.2	Chemical-containing residue arising from decontamination. Sludge from treatment of waste water arising out of cleaning / disposal of barrels/containers

35.	Purification and treatment of exhaust air/gases, water and waste water from the processes in this schedule and common industrial effluent treatment plants (CETP's)	1.1 1.2 1.3 1.4 1.5	Exhaust Air or Gas cleaning residue Spent ion exchange resin containing toxic metals Chemical sludge from waste water treatment Oil and grease skimming Chromium sludge from cooling water
36.	Purification process for organic compounds and solvents	1.1 1.2	Any process or distillation residue Spent carbon or filter medium
37.	Hazardous waste treatment processes, e.g. pre-processing, incineration and concentration	1.1 1.2 1.3	Sludge from wet scrubbers Ash from incinerator and flue gas cleaning residue Concentration or evaporation residues
38.	Chemical processing of Ores containing heavy metals such as Chromium, Manganese, Nickel, Cadmium etc.	1.1 1.2	Process residues Spent acid

INTRODUCTION TO INDIA'S FOREIGN TRADE

Historical Evolution of Indian Foreign Trade Policies

With the onset of globalization and integration, India formulated various laws and policies to streamline exports and imports in the country, and called it the Exim Policy of 1992. Exports from India started from US\$ 17.86 billion in 1992 and increased to US\$ 292.9 billion in February 2020. On the other hand, imports stood at US\$ 89 billion back in 1992 but currently stand at US\$ 436.03 billion.⁴ Export promotion, however, is considered as a national priority in India, and is said to promote the country's economic standing by creating jobs, scaling up infrastructure, increasing the inflow of foreign exchange etc. India primarily imports crude oil, industrial raw material, consumables, fertilizers, defense equipment, technology, etc.

India was always a surplus country until the colonial rule of Great Britain. The statute, Sea Customs Act, 1878 was enacted by the colonial government. It initially contained a bias against on-British imports, and charged higher import duties on such products.⁵

⁴ *Export Import Data Bank*, MINISTRY OF COMMERCE & INDUSTRY, DEPARTMENT OF COMMERCE, https://commerceapp.gov.in/eidb/default.asp (last visited Sept. 19, 2020).

⁵ NATIONAL BIOLOGICAL DIVERSITY AUTHORITY, HANDBOOK ON FOREIGN TRADE POLICY AND GUIDE TO EXPORT & IMPORT, http://nbaindia.org/uploaded/Biodiversityindia/Legal/6.%20Import%20and%20Export%20(Control) %20Act,%201947.pdf (last visited Sept. 19, 2020).

During the Second World War, the Defence of India Rules was enacted in 1939, to conserve the foreign exchange within the country. Under these rules, the imports of certain products were controlled. However, this law terminated at the end of the War, and the safeguard provisions in these Rules became a part of Imports and Exports (Control) Act, 1947. This Act was supposed to be in effect only for 3 years from 1947 onwards, so as to control imports and exports to and from India. It however, became a standing legislation.⁶ To encourage domestic industries and protect them from the ingress of imports, India issued Imports (Control) Order, 1955, making import licensing compulsory. In the meantime, the Customs Act of 1962, which played a major role in controlling Indian imports and exports, replaced the Sea Customs Act. The import of bullion and currency were brought under control through Foreign Exchange Regulations Act, 1973.

Until 1991, exports were strictly regulated through the Exports (Control) Order, 1988. The need to adapt to a liberalized and globalized world order, however, led to the introduction of the Foreign Trade (Development & Regulation) Act in 1992 to encourage exports and imports in India.

Initially the Central Government published a yearly policy for foreign trade, called the 'Red Book'.⁷ This publication later started getting notified every three years, and was replaced by a five-year policy in 1992. This was done to create a sense of lucidity for the traders engaged in imports and exports. Until 1992, the Open General License policy prevailed, under which imports and exports were permitted based on certain conditions. However, from 1992, the policy was repealed and licenses were made irrelevant to imports and exports. Nevertheless, since the creation of the World Trade Organisation, India has maintained some restrictions in the form of Export and Import licensing.

Indian Foreign Trade in Chemicals

Major chemical exporters in the world include the United States of America, China, Germany, Belgium, and Switzerland.⁸ India stands as the sixth biggest producers of chemicals in the world. Further, it ranks as the fourth biggest producer of

⁶ *Id*.

⁷ Id.

⁸ World Chemicals Exports by Country 2018, WORLD INTEGRATED TRADE SOLUTION, https://wits. worldbank.org/CountryProfile/en/Country/WLD/Year/LTST/TradeFlow/Export/Partner/by-country/ Product/28-38_Chemicals (last visited Sept. 19, 2020).

agrochemicals in the world, and the third biggest producer of chemicals in Asia. India also contributes sixteen percent of the global production of dye intermediaries.⁹ The Indian Chemical Industry amounts to 3.4% of the world's chemical industry by size, and over 70,000 products in India depend on chemicals.¹⁰ With the production of petrochemicals, agrochemicals, dye intermediaries such as paints and varnishes, and pharmaceuticals, India made US\$ 26 billion in 2018-19 and US\$ 11.06 billion in April-Oct 2019 alone.¹¹

Over time, the Indian Government has taken various initiatives to boost India's trade in chemicals. The CHEMEXCIL was established in 1963, by the Ministry of Commerce and Industry, as the promoter of exports in Basic Chemicals, Cosmetics & Dyes such as dyes and its intermediaries, basic organic and inorganic chemicals inclusive of agrochemicals, cosmetics, toiletries and essential oils, specialty chemicals, lubricants, etc.¹² The United States, United Arab Emirates, United Kingdom, etc. are leading importers of Indian cosmetics, toiletries and essential oils.¹³ The Government of India has also allowed 100% Foreign Direct Investment related to the chemical sector under the automatic route, subject to applicable laws and regulations. FDI under this head amounted to a total of 3.95% of the FDI inflow to India in 2019. Several Government measures like the Make in India, the easing of environmental rules for chemical industries, and the introduction of Single Window Interface for Facilitating Trade (SWIFT) have supported the growth of chemical industries in India.

Legal Framework for Foreign Trade Relating to Chemicals in India

The various Indian laws pertaining to Import and Export are:

- Foreign trade (Development & Regulation) Act, 1992
- Foreign Trade (Regulation) Rules, 1993
- Foreign Trade (Exemption) Order, 1993
- Foreign Trade Policy
- Handbook of Procedures

⁹ *Chemical Industry in India*, INDIAN TRADE PORTAL, https://www.indiantradeportal.in/vs.jsp?lang =0&id=0,30,50,166 (last visited Sept. 19, 2020).

¹⁰ *Id*.

¹¹ *Id*.

¹² CHEMEXCIL, https://chemexcil.in (last visited Sept. 19, 2020).

¹³ Chemical Industry in India, supra note 9.

- ITC (HS) Classification of Import and Export Policy
- Customs Act, 1962

Apart from these general laws, India has enacted several specific laws that regulate, and are specifically applicable to, the import and export of chemicals. Such laws are:

- Explosives Act, 1884
- Explosive Substance Act, 1908
- Explosives Rules, 2008
- Ammonium Nitrate Rules, 2012
- Narcotic Drugs and Psychotropic Substances Act, 1985
- Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 as amended up to 1994.
- Hazardous Substances (Classification, Packaging and Labeling) Rules, 2011
- Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 as amended up to 2020.
- Factories Act, 1948
- Public Liability Insurance Act, 1991
- Public Liability Insurance Rules, 1991
- Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
- Central Motor Vehicle Rules, 1989
- Aircraft (Carriage of Dangerous Goods) Rules, 2003
- Indian Standard IS 1446:2002
- Gas Cylinder Rules, 2004
- Petroleum Act, 1934
- Petroleum Rules, 2002
- Calcium Carbide Rules, 1987
- Chemical Weapon Convention Act, 2000
- Insecticides Act, 1968

• Batteries (Management & Handling) Rules, 2001 as amended up to 2010

Of these legislations, the ones directly relevant to the import and export of chemicals shall be discussed in this chapter.

Foreign Trade (Development & Regulation) Act, 1992 as amended in 2010¹⁴

Under the Exports (Control) Order, 1988, the objective was to prohibit exports and control imports. The objectives of this Act, however, have changed to developing and regulating foreign trade, to enable imports and enlarge exports in India. Under the provisions of this Act, the Central Government has been given the power to regulate foreign trade issues such as restrictions on import and export of goods, services or technology.¹⁵ The Central Government has to prepare and notify the export-import policy i.e., the "foreign trade policy" of India, and has the powers to amend it from time to time.¹⁶ The office of the Director General of Foreign Trade (DGFT) has been established under this Act, and is empowered to guide the Central Government in developing and implementing the foreign trade policy.¹⁷ The Act also provides that only persons holding the Import Export Code Number, and a license to import and export, would be allowed to engage in foreign trade of goods, and contains provisions regarding the issuance, renewal, refusal and cancellation of the same.¹⁸ It empowers authorities to conduct searches and seizures and impose penalties in case of violation of foreign trade rules. Further, it provides for the adjudicatory mechanisms for such violations along with provisions relating to appeals etc.¹⁹ The Central Government is also provided with the power to make Rules under Section 19 of the Act.

Foreign Trade (Regulation) Rules, 1993 as amended in 2015²⁰

These Rules have been framed under the above-mentioned Section 19 of the Foreign Trade (Development and Regulation) Act, 1992. They empower the DGFT to issue licenses to importers and exporters, and also issue special licenses to those with

- 18 Id. § 7.
- 19 *Id.* §§ 10, 17.

¹⁴ The Foreign Trade (Development and Regulation) Act, 1992.

¹⁵ *Id.* § 3.

¹⁶ Id. § 5.

¹⁷ *Id.* § 6.

²⁰ Foreign Trade (Regulation) Rules, 1993.

a suspended or cancelled license.²¹ They provide for a scale containing the fees to be paid by importers and exporters to obtain licenses, while exempting certain importers/ exporters from such fees.²² The instances when the issuance of licenses can be refused are mentioned in Rule 7 of Foreign Trade (Regulation) Rules, 1993, along with the procedure regarding the amendment,²³ suspension,²⁴ and cancellation²⁵ of the licenses. The rules also provide for search, seizure,²⁶ and the confiscation and redemption of goods.²⁷

Foreign Trade (Exemption) Order 1993 as amended in 2017²⁸

This Order has been issued by the Union Government under Sections 3 & 4 of the Foreign Trade (Development and Regulation) Act, 1992. It contains information pertaining to the list of goods that are exempted from the application of the above-mentioned Foreign Trade (Regulation) Rules. Such goods, in the context of imports, include those pertaining to defense, those required for the Central or State Government or their PSUs (Public Sector Undertakings), goods in transit, those covered under baggage rules, those imported for personal use or by a diplomat, and those imported for temporary use such as for exhibitions and fairs.²⁹ The goods exempted in the context of exports include those made by the authorities of Central Government, baggage and goods in transit or trans-shipment, those meant to be re-exported, goods produced by EOUs (Export Oriented Units) etc.³⁰

Foreign Trade Policy

The policy contains guidelines and directions that arise out of Section 5 of the Foreign Trade (Development and Regulation) Act 1992, and is typically updated on 31st March every 5 years. Accordingly, the current Foreign Trade Policy, i.e., 2015-2020 was to be amended on 31st March, 2020, but has been extended till 2021 due to the onset of

27 Id. Rules 17 & 18.

²¹ *Id.* Rule 3.

²² Id. Rule 5.

²³ Id. Rule 8.

²⁴ *Id.* Rule 9.

²⁵ Id. Rule 10.

²⁶ Id. Rule 15.

²⁸ Ministry of Finance, Foreign Trade (Exemption from Application of Rules in Certain Cases) Order, 1993, S.O. 1056(E) (Notified on Dec. 31, 1993).

²⁹ Id. Order 3.

³⁰ Id.

the global pandemic.³¹ The current policy has been tuned to encourage production, and support Central Government initiatives such as Make in India and Digital India.

The Foreign Trade Policy 2015-2020 contains 9 chapters. The first chapter pertains to the legal framework of the policy, along with EXIM rules related to trade facilitation and ease of doing business. This is followed by chapters on:

- General provisions pertaining to EXIM;
- Indian schemes related to exports;
- Duty exemption and remission schemes;
- Export promotion capital goods (EPCG) scheme;
- Export Oriented Units (EOUs), Electronics Hardware Technology Parks (EHTPs), Software Technology Parks (STPs) and Bio-technology Parks (BTPs);
- Deemed exports;
- Quality complaints and trade disputes;
- A glossary of terms.
- The policy introduces two new schemes, i.e., Merchandise Exports from India Scheme (MEIS) and Service Export from India Scheme (SEIS).
- Under the MEIS, which integrated 5 different schemes into one, aid has been extended towards major markets of certain products and pharmaceuticals, chemicals, etc. being among them.
- Chapter 2.09 pertains to the export of SCOMET (Special Chemicals, Organisms, Materials, Equipment and Technologies) items. The policy states that these items are to be governed under Chapter 4A of the Foreign Trade (Development and Regulation) Act, 1992, ITC (HS) Classification of Export & Import Items, and the Handbook of Procedures.

³¹ Kritika Suneja, *Government extends foreign trade policy by one year*, THE ECONOMIC TIMES (Apr. 01, 2020), https://economictimes.indiatimes.com/news/economy/foreign-trade/government-extends-foreign-trade-policy-by-one-year/articleshow/74919920.cms.

Handbook of Procedures and the Appendices & Aayat Niryat Forms³²

Forming part of the Foreign Trade Policy, the Handbook contains procedures for the importers, exporters, licensing authorities or such authorities to implement the foreign policy or the provisions of the Foreign Trade (Development & Regulation) Act. The primary objective of the handbook is to lay down simple procedures to be followed by both the administration and the importer and exporter to ease the management of foreign trade.

The handbook contains, under Chapter 2, general provisions related to exporters and importers. It explains various aspects of trade, including (a) the countries with which import and export activities can be undertaken; (b) the applications to be made by importer and exporter, and the respective applicable codes (Importer and exporter code); (c) authorization issues; (d) provisions in case of loss of documents; (e) issue of duplicate copies of authorization; (f) items permitted and restricted to be imported and exported; (g) treatment of sample and exhibits; (h) warehousing facilities; (i) treatment of SCOMET items, etc. Chapter 3 contains provisions pertaining to the new export promotions schemes, such as the MEIS & SEIS. Chapter 4 pertains to goods exempted from duty and the remission schemes, with special mention of the gems and jewelry sector. Chapters 5 through 9 contain other directions pertaining to the foreign trade policy.

ITC (HS) Classification of Import and Export Policy

The Harmonized System was the result of the work of the World Customs Organisation in 1988 and is a global nomenclature to classify goods. All internationally traded goods must contain the 6-digit number provided under this system to fulfill custom requirements internationally, and to satisfy Harmonized Tariff Schedule prepared by an importing country. These codes assist the authorities in determining the tariff or the rate of duty of a good.

The term ITC (HS) refers to the Indian Trade Classification (Harmonized System). The Indian system provides for additional 2-digits in the internationally accepted 6-digits HS number. Therefore, India has an 8-Digit system to classify goods imported and exported in Schedule 1 & 2 respectively.

³² Ministry of Commerce and Industry, Handbook of Procedures (1st April, 2015 – 31st March, 2020) (2020), https://mofpi.nic.in/sites/default/files/updated_hbp_2015-2020.pdf.

Section VI of the ITC (HS) 2017 deals with Products of the chemical or allied industries, and contains 11 chapters (chapters 28-38).³³ The different industries mentioned under the chapters are inorganic³⁴ and organic³⁵ chemicals, pharmaceuticals products,³⁶ ertilizers,³⁷ tanning or dyeing extracts,³⁸ essential oils and cosmetics etc.,³⁹ soap, organic surface-active agents, washing preparations etc.,⁴⁰ glues, enzymes, etc.,⁴¹ explosives and combustible preparations,⁴² photographic or cinematographic goods,⁴³ and miscellaneous chemical products.⁴⁴

The import and export of certain precursor chemicals are highly regulated; such chemicals including detonators,⁴⁵ acetic anhydride,⁴⁶ urea,⁴⁷ and ammonium nitrate⁴⁸ are among them.⁴⁹Any changes to the ITC (HS) are only made after a consultation process involving the DGFT, the Department of Revenue, and the DGCIS (Director General of Commercial Intelligence and Statistics).

The Customs Act, 1962

Chemicals may be used for the production of pharmaceuticals, agriculture, and/ or research purposes. However, they can also be used by various elements of the

- 34 *Id.* § VI.
- 35 Id. Chapter 29.
- 36 Id. Chapter 30.
- 37 Id. Chapter 31.
- 38 Id. Chapter 32.
- 39 Id. Chapter 33.
- 40 Id. Chapter 34.
- 41 Id. Chapter 35.
- 42 Id. Chapter 36.
- 43 Id. Chapter 37.
- 44 Id. Chapter 38.
- 45 Requires import and export licenses respectively from DGFT.
- 46 Required import license from DGFT.
- 47 Regulations related to import of industrial grade urea are relaxed subject to fulfillment of certain conditions. However non-industrial grade urea can only be imported by a Canalized Agent or State Trading Enterprise (STEs). Export of Urea requires export license from the DGFT.
- 48 If weight of nitrogen is more than 45% then import license is required from Chief Controller of Explosives. Along with regulations on import and exports of Ammonium Nitrate, their manufacture, storage, packaging, labelling, transport etc. are also regulated under the provisions of Ammonium Nitrate Rules, 2012 along with those of Explosive Act 1884 and Explosive Rules 2008.
- 49 Sodium Nitrate, Potassium Nitrate and calcium Ammonium Nitrate can be freely imported.

³³ Indian Trade Classification (Harmonized System) 2017, Directorate General of Foreign Trade, Government of India, http://dgftcom.nic.in/exim/2000/itchs2017/ITCHS2017.html (last visited Feb. 25, 2021).

society in making chemical weapons. This provides the basis for the establishment of controls to safeguard legitimate trade in chemicals and hazardous goods. To facilitate this objective, various legislations have been enacted, the Customs Act of 1962 being one of them.

This Act is in furtherance of Article 265 of the Indian Constitution, and provides for an indirect tax on the entry and exit of goods, aircrafts, vessels, etc., to and from India. The provisions of this legislation primarily deal with the levy and collection of tax in the form of duties. However, the objectives of this Act extend to the regulation of foreign trade, securing domestic industry, block smuggling, retention and expansion of foreign exchange, etc. The Custom duties are to be levied as provided for under the Customs Tariff Act, 1975.⁵⁰

The Act provides for (a) the appointment of Customs officers and their powers;⁵¹ (b) the appointment of customs ports, airports and warehouses;⁵² (c) prohibitions on the import and export of goods; (d) illegal imports and export of specific goods and related powers, including power to exempt certain goods;⁵³ (e) the valuation of goods, levy, recovery and refund of duty;⁵⁴ (f) clearance of goods received;⁵⁵ (g) provisions related to advance ruling,⁵⁶ warehousing,⁵⁷ transit goods,⁵⁸ and baggage goods;⁵⁹ (h) the powers of search and seizure⁶⁰ and confiscation of goods;⁶¹ (i) offences and prosecutions⁶² etc.

Several informal arrangements, such as some Multilateral Export Control Regimes like the Australia Group, aim at preventing the dissemination of chemical and biological weapons. The group consists of participating countries that meet annually

- 52 *Id.* Chapter III, §§ 7 10.
- 53 *Id.* Chapters IV, IVA, IVB, IVC, §§ 11, 11A 11N.
- 54 Id. Chapter V, §§ 12 28BA.
- 55 *Id.* Chapter VII, §§ 44 51.
- 56 *Id.* Chapter VB, §§ 28E 28M.
- 57 Id. Chapter XI, §§ 57 73.
- 58 *Id.* Chapter VIII, \$\$ 52 56.
- 59 *Id.* Chapter XI, §§ 77 90.
- 60 *Id.* Chapter XIII, §§ 100 110A.
- 61 *Id.* Chapter XIV, §§ 111 127 (any goods imported or exported or attempted to do so by entering into Indian customs waters in contravention to any restrictions imposed by any law are liable to be confiscated and the importer or exporter, as the case may be, are liable to pay penalty for such an act).
- 62 *Id.* Chapter XVI, §§ 132 140A.

⁵⁰ The Customs Act, 1962 § 12.

⁵¹ *Id.* Chapter II, §§ 3 – 6.

to discuss export licensing measures to reduce the risk of proliferation of chemical and biological weapons.⁶³ Similarly, the Chemical Weapons Convention, 1993, prohibits the production, evolution, purchase, movement, utilization, and storage of chemical weapons.⁶⁴ This Convention acts as a guiding document to the Customs Officers while executing their responsibilities under the Customs Act.

The Customs Act, along with Customs Tariff Act, has to be read with various Rules and Regulations made by the Central Government and the Central Board of Excise and Customs. Such Rules and Regulations include the Customs, Central Excise Duties and Service Tax Drawbacks Rules, 1995; the Custom Valuation (Determination of Price of Imported Goods), 2007; the Custom Valuation (Determination of Value of Export Goods) Rules, 2007; the Notified goods (Prevention of Illegal Import) Rules, 1969 etc.

PROCEDURE FOR IMPORTS AND EXPORTS

For both imports and exports, typically, traders are required to obtain the necessary licenses and comply with relevant provisions before the goods leave their premises. They are to make the necessary transport arrangements, to assign respective and suitable warehousing facilities for the goods to be shipped (here, the respective chemicals), to obtain customs clearance, and to remit the respective taxes. An additional safety measure when it comes to import and export of chemicals is to verify that the goods concerned do not fall in the "illegal" category, as provided under the various laws mentioned above.

There are two set of documents that must be maintained by importers and exporters, regardless of the kind of goods they deal with. They are:

- Commercial documents, such as the ones interchanged between the buyer and the seller;
- Regulatory documents from authorities such as customs, excise, and export promotion bodies, to successfully claim the benefits extended by the government to exporters and importers.

⁶³ *The Australia Group: An Introduction*, The Australia Group, https://www.dfat.gov.au/publications/ minisite/theaustraliagroupnet/site/en/introduction.html (last visited Sept. 19, 2020).

⁶⁴ *Mission: A World Free of Chemical Weapons*, Organisation of the Prohibition of Chemical Weapons, https://www.opcw.org/about-us/mission (last visited Sept. 19, 2020).

IMPORT PROCEDURE

The various steps that need to be undertaken in the import of goods are:

Procuring the Import-Export Code: As provided under Section 7 of the Foreign Trade (Development & Regulation) Act, 1992,⁶⁵ every importer and exporter of goods must obtain an Importer Exporter Code Number, which is granted by the DGFT. Registering for and obtaining this Code takes around 10-15 days, and once obtained, it is valid for the lifetime of the trader. This number is essential to clear customs, transact in foreign currency, dispatch shipments, etc. Section 8 of the Act provides for the suspension and cancellation of this Code in case of contravention of any provisions of the Foreign Policy, or such other notified laws.

Legal compliance with the provisions of different laws: The trader must satisfy the notifications issued by the Central Government from time to time under Section 11 of Customs Act.⁶⁶ Further, the trader must pay special attention to the ITC (HS), which specifies the three categories of goods for imports, and has to obtain additional licenses or permissions as required. The categories of goods are as follows:

- a. Restricted or licensed goods: these goods are to be imported only after obtaining relevant licenses from the regional licensing authorities. These licenses are provided for 2 years for capital goods and for 18 months for other goods.
- b. Canalized goods: these are goods that require special care in terms of transportation and import procedures to be followed, and can only be imported through specialized agents. Most of the chemicals, petroleum products, agricultural products, oils and pharmaceutical goods fall under this category of goods.
- c. Prohibited goods: goods under this category are strictly prohibited from being imported into India and include wild animals, animal origin oils, fresh ivory, etc.
- d. Goods that do not fall under any of the above category: they can be freely imported in India without the need for a license.

Once the requirements arising from the classification of goods as per ITC (HS) are complied with, the trader must apply for either a general license or specific license,

⁶⁵ The Foreign Trade (Development & Regulation) Act, 1992, Chapter III.

⁶⁶ Id. § 11(2).

which allow goods to be imported from any country or from a specific country respectively. Import licenses are required for import clearance and are renewable, usually being valid for 2 years for capital goods and 18 months for other goods.

Bill of Entry and Custom clearance: Under Section 46 of the Customs Act, 1962, every importer must obtain a bill of entry containing all the goods mentioned in bill of lading, as given by the carrier or consignor. The Bill of entry is said to contain the qualities of the goods, their quantity and value. The importer must also submit connected documents relating to the goods such as certificate of origin, certificate of inspection, bill of exchange, invoice and packing list etc.

- a. In the case of electronic data interchange, instead of the bill of entry, the importer fills the cargo declaration and proceeds for custom clearance.
- b. The customs officers are entrusted with examining and comparing the bill of entry with the imported goods. In case the description in the bill of entry for home consumption or warehousing⁶⁷ matches that of the goods imported, the goods are allowed to be sent to warehousing.

Calculating of import duty and clearance of goods: Customs duty on the imported goods is calculated as per Customs Tariff Act, 1975.⁶⁸ The First Schedule of the Act provides for various duties to be paid by the importer.⁶⁹

- a. There are two types or rates mentioned in the First Schedule:
 - i. Standard rate: these rates are applicable to imports of goods that originate in countries with which the Indian Government has not entered into any trade agreement.
 - ii. Preferential rate: these rates are lower than the standard rates, and are specified by the Indian Government from time to time. They are usually a result of a trade agreement between India and the country of origin of the goods.
- b. Customs authorities, depending on the goods imported, would also levy certain other types of duties. These include the anti-dumping and safeguard duty (to protect Indian domestic goods and industries, as the case may be), and social welfare surcharge.

⁶⁷ The Customs Act, 1962, § 46.

⁶⁸ The Customs Tariff Act, 1975 § 2.

 $^{69\ \} Id.$ Schedule I, Chapter 28 – Products of the Chemical or Allied Industries.

- c. Under the new goods and services tax (GST), the authorities are also required levy integrated goods and services tax (IGST) as provided under the Integrated Goods and Services Tax Act 2017.⁷⁰
- d. Customs handling fee: One percent customs handling fee is applicable on all imported items without any exceptions.

EXPORT PROCEDURE

- 1. Step one of the import procedure, relating to obtaining the Importer-Exporter Code, applies to exporters as well.
- 2. Step two pertains to the classification of goods for export, and varies lightly from the above-mentioned import procedure. It is as follows:
 - a. Restricted or licensed goods: the exporter, after obtaining a license to export, must comply with the conditions specified in the license.
 - b. Prohibited goods: as mentioned above, these goods are expressly prohibited from being exported.
 - c. State Trading Enterprises: these are established by the Government of India to specifically engage in, or canalize, the import and export of goods such as chemicals, drug, edible oils, wheat, sugar etc. This is undertaken to maintain equitable distribution of these goods for mass consumption.⁷¹ These goods, however, have to comply with the Foreign Trade Policy.
- 3. Bill of export or shipping bill:⁷² this is part of the export customs formality⁷³ that facilitates the exporter to claim refunds, duty drawbacks or such other export incentives that the Central Government announces from time to time.
- 4. Registration with the Chamber of Commerce: an exporter must register themselves with a Chamber of Commerce to obtain either the Preferential or Non-preferential Certificates of Origin that certify that the goods have originated in India.⁷⁴

⁷⁰ The Integrated Goods and Services Tax Act, 2017 § 5.

⁷¹ *History*, The State Trading Corporation of India Limited, http://www.stclimited.co.in/content/history (last visited Sept. 19, 2020).

⁷² Shipping Bill and Bill of Export (Form) Regulations, 1991.

⁷³ The Customs Act, 1962, \S 50, 60 & 157.

⁷⁴ This is in lines with the International Convention Relating to Simplification so Customs Formalities, 1923. The convention recognized the commerce chambers as authorities competent to issue Certificate of Origins; *See* Saloni Jha, *Issuing Certificates or Origin: Industry Chamber's Experience, Federation of Indian Chambers of Commerce*, https://www.unescap.org/sites/default/files/-ind2.pdf (last visited Sept. 19, 2020).

5. Calculation of duty: duty on the exported goods is calculated as per Customs Tariff Act 1975.⁷⁵ The Second Schedule of the Act provides for various duties to be paid by the exporter.⁷⁶ Most of the exported items are exempt from the duty.

ANCILLARY LEGAL PROVISIONS

Explosives Act, 1884

Section 4(d) of the Explosives Act, 1884 lists all the chemicals that are deemed to be "explosive" in India. This Act empowers the Central Government to restrict the import and export of the chemicals specified under Section 4(d),⁷⁷ and to prohibit their manufacture or possession.⁷⁸ Licenses are granted or refused⁷⁹ or suspended or revoked,⁸⁰ as the case may be, as per Explosives Rules, 2008.⁸¹

Explosives Rules, 2008 as amended in 2019

Under these rules, the District Magistrate, Controller, and Chief Controller of Explosives are the competent licensing authorities.⁸²

The Narcotic Drugs and Psychotropic Substances Act, 1985 and The Narcotic Drugs and Psychotropic Substances (Regulation of Controlled Substances) Order, 2013

The import into India of the chemicals specified in the Schedule of the Act, in accordance of Section 2(xxiii) of the Act, and also inter-State trade of specified chemicals,⁸³ is controlled and regulated under this Act.⁸⁴ The Central Government,⁸⁵ along with the State Government,⁸⁶ is empowered to permit, control, and regulate trade in this regard. The manufacturer, seller, distributor, importer and exporter are required to compulsorily maintain records of certain chemicals specified in the

86 *Id.* § 10.

⁷⁵ The Customs Tariff Act, 1975, § 2.

⁷⁶ Id. Schedule II.

⁷⁷ The Explosives Act, 1884, § 5.

⁷⁸ Id. § 6.

⁷⁹ *Id.* § 6C.

⁸⁰ *Id.* § 6E.

⁸¹ *Id.* § 6B.

⁸² Explosives Rules, 2008, Rule 2(30) read with Schedule IV Part 1.

⁸³ The Narcotic Drugs and Psychotropic Substances Act, 1985, §§ 2(xxiv) and 2(xxv).

⁸⁴ Id. § 8.

⁸⁵ *Id.* § 9.

Schedule⁸⁷ and are required to report the same to the Narcotics Control Bureau established under the Act.⁸⁸ The Act also contains penal provisions, both in the form of imprisonment and fine, in the case of illegal import or export into or from India, and illegal inter-State trade.

Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989

Part II of the Schedule 1 of the Rules lists hazardous and toxic chemicals.⁸⁹ Rule 18 of these Rules specify certain procedural requirements for the import of all the chemicals satisfying any of the criteria in Part I of the Schedule, or mentioned in Part II. Some of the chemicals are Acetic-Anhydride,⁹⁰ Acetone, Aluminium Powder, Ammonium Nitrate,⁹¹ Hydrogen Peroxide, Nitric Acid, Potassium Chlorate, Sodium Chlorate, and Potassium Perchlorate. Rule 18(6) specifies that the transport of chemicals listed in the above-mentioned Schedule must be in accordance with the Central Motor Vehicles Rules, 1989 and the Motor Vehicles Act, 1988. These procedural requirements are to be followed in addition to those specified under ITC (HS) mentioned earlier in this chapter.

The importer is required to provide specified information to the authorities within 30 days of the arrival of the shipment, or on such reasonable date as possible before the date of import. Such information must include the date of import, name and address of the consignee, mode of transportation into India, port of entry in India, quantity of chemicals and safety measures undertaken.⁹²

Central Motor Vehicle Rules, 1989

The chemicals industry depends heavily on its supply chain. Such supply chains are spread across and are typically complex, adding to the fluctuating trade volumes. Producers and traders usually work with a flexible supply chain to keep the business flowing and that is where legislations relating to transport come in.

⁸⁷ *Id.* § 9A.

⁸⁸ Id. § 4(3).

⁸⁹ Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, Rules 2, 4, 17 & 18.

⁹⁰ The Narcotic Drugs and Psychotropic Substances Act, 1985, § 9(2) (export of this chemical requires a "No objection certificate" from Narcotics Commissioner).

⁹¹ With less than 45% weight of nitrogen content.

⁹² Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, Rule 18.

The Motor Vehicles Act, 1988, which is concerned with regulating the road transport vehicles, contains provisions relating to registration and permits for vehicles, licenses of drivers, and traffic regulations, along with offences and liabilities. The Central Motor Vehicles Rules 1989 have been framed in furtherance of the provisions of the Act.

Under the Rules, Chapter V which deals with the Construction, Equipment and Maintenance of Motor Vehicles, Special Provisions, contains Rules 128 to 137. Of these rules, Rules 129 to 137 are exclusively concerned with safe transportation of chemicals and hazardous goods. The Rules provides for displaying labels, carrying safety equipment on vehicles that carry chemicals and hazardous goods,⁹³ how and where these labels must be displayed on the vehicles,⁹⁴ roles and responsibilities of the consignor⁹⁵ or transporter or owner of the vehicle⁹⁶ or the driver⁹⁷ during transportation, and the display of emergency information panel on the vehicle.⁹⁸ Rule 137 provides for the labelling of dangerous and hazardous goods. The Rule contains 3 tables: Table I provides class labels for the classification of goods, Table II provides a list of around 2300 chemicals as hazardous goods.

Draft Notification on Dangerous Goods (Classification, Packaging and Labeling) Rules, 2013⁹⁹

These Draft Rules find their foundation in the Recommendations of Sub-Committee on Globally Harmonized System of Classification and Labeling of Chemicals. The United Nations organ came up with this system of classification after recognizing the expansion of global trade in chemicals, to provide for the safe transport, use, and disposal of chemicals. These aims, it is recognized, are promoted through the introduction of an internationally coordinated approach to the classification and labeling of such goods. The labeling on products with hazardous and toxic chemicals is believed to protect human and environmental health while transporting, handling, and using the chemicals.¹⁰⁰

⁹³ Central Motor Vehicle Rules, 1989, Rule 129.

⁹⁴ *Id.* Rule 130.

⁹⁵ Id. Rule 131.

⁹⁶ Id. Rule 132.

⁹⁷ Id. Rules 133, 135 & 136.

⁹⁸ Id. Rule 134.

⁹⁹ Dangerous Goods (Classification, Packaging and Labelling) Rules, 2013.

¹⁰⁰ About the GHS, UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE, https://www.unece.org/trans/danger/publi/ghs/ghs_welcome_e.html (last visited Sept. 19, 2020).
Accordingly, the Government of India formulated these Draft Rules, which are yet to be notified. They contain provisions regarding the classification of goods,¹⁰¹ the list of dangerous goods,¹⁰² labeling and marking requirements,¹⁰³ the responsibilities of the occupier and the consigner,¹⁰⁴ the documents required to accompany consignment,¹⁰⁵ and the authorities therein.¹⁰⁶

Indian Standard (IS) 1446:2002

The United Nations Subcommittee of Experts on the Transport of Dangerous Goods, which is a part of the United Nations Economic and Social Council, prepared Model Regulations that include the United Nations Recommendations on the Transport of Dangerous Goods.¹⁰⁷ The UN Orange book primarily acts as the guidance book with regard to the transport of dangerous goods.¹⁰⁸ It is concerned with the transport of chemicals and hazardous goods by all modes of transportation. Grouped into 9 classes, the transport hazards are subdivided into different groups.

Based on the United Nations Model Regulations, India developed a country-specific Standard in classifying chemicals and hazardous goods, based on the risks involved. The standard lists out the goods with the UN number, to enable the safe passage of chemicals and hazardous goods through national and international transport. The "Indian Standard" has been adopted by the Bureau of Indian Standards, finalized by the Chemical Hazards Sectional Committee, and approved by the Chemical Division Council in India.¹⁰⁹

Aircraft (Carriage of Dangerous Goods) Rules, 2003

These Rules are applicable to all aircrafts registered in India or operated by an Indian aircraft operator, regardless of where they operate; and to all aircrafts that are currently

¹⁰¹ Dangerous Goods (Classification, Packaging and Labelling) Rules, 2013, Rule 5.

¹⁰² Id. Rule 2 read with Schedule I.

¹⁰³ *Id.* Rule 8.

¹⁰⁴ *Id*. Rule 4.

¹⁰⁵ *Id*. Rule 9.

¹⁰⁶ *Id.* Rule 10 & 11.

¹⁰⁷ *Dangerous Goods*, UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE, https://www.unece.org/ru/transport/areas-of-work/dangerous-goods/opasnye-gruzy-glavnaja-stranica.html (last visited Sept. 19, 2020).

¹⁰⁸ UN Orange Book, CHEMSAFETYPRO (July 01, 2016), https://www.chemsafetypro.com/Topics/TDG/UN_Orange_Book.html.

¹⁰⁹ BUREAU OF INDIAN STANDARDS, INDIAN STANDARD 1446 – CLASSIFICATION OF DANGEROUS GOODS (2d Rev., 2002), https://archive.org/details/gov.in.is.1446.2002/page/n3/mode/2up.

in India, including the persons and agents operating such aircrafts. The Rules specify that dangerous goods shall only be carried after the Aeronautical Authority of the State certifies the transportation.¹¹⁰ Further, such transportation requires the written consent and permission of the Central Government (under the Atomic Energy Act, 1962), the Director-General of Civil Aviation, etc.¹¹¹ The Rules also contain specific provisions related to packing,¹¹² labeling,¹¹³ and marking¹¹⁴ of dangerous goods. The Rules enumerate the Shipper's¹¹⁵ and Operator's¹¹⁶ responsibilities, to be in accordance with the Technical Instructions.¹¹⁷ The goods are to be packed, marked, labeled, and be accompanied with the required documents and details of the State of Origin.

E-Waste (Management and Handling) Rules, 2016

Electronic waste has been excluded from the Hazardous Waste Management Rules. However, given the increasing volume of electronic waste worldwide and in India, the E-Waste (Management and Handling) Rules, 2016 were notified. Under these Rules, 'e-waste' means electrical and electronic equipment, wholly or in part discarded as waste by the consumer or bulk consumer, as well as rejects from manufacturing, refurbishment, and repair processes.¹¹⁸ The Rules also recognize the existence of an e-waste exchange, a market for electronic waste trading.¹¹⁹ The definition of 'producer' under these Rules has been kept broad so as to include individuals who offer to sell imported electrical and electronic equipment, or such components, or consumables, or parts, or spares.¹²⁰ Rule 21 lays down a liability regime which states that any individual, that is a manufacturer, producer, importer, transporter, refurbisher, dismantler and recycler, shall be liable for all damages caused to the environment or third party due to improper handling and management of e-waste. This provides due regard to the impact of this form of waste on the environment.

¹¹⁰ Aircraft (Carriage of Dangerous Goods) Rules, 2003, Rule 3.

¹¹¹ Id. Rule 3(2) proviso.

¹¹² *Id.* Rule 5.

¹¹³ Id. Rule 6.

¹¹⁴ Id. Rule 7.

¹¹⁵ *Id.* Rule 8.

¹¹⁶ Id. Rule 9.

¹¹⁷ *Id.* Rule 2(18) ("Technical Instructions" means the instructions for the safe transport of dangerous goods by air, approved and issued periodically in accordance with the procedure established by the International Civil Aviation Organisation Council).

¹¹⁸ E-Waste (Management and Handling) Rules, 2016, Rule 3(r).

¹¹⁹ *Id.* Rule 3(s).

¹²⁰ Id. Rule 3(cc).

Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Microorganisms or Cells Rules, 1989

It is crucial to examine the manner in which the import and export of hazardous microorganisms is regulated. Hazardous microorganisms, genetically engineered microorganisms and cells are regulated through the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Microorganisms or Cells Rules, 1989. 'Microorganisms' under this Act include all the bacteria, viruses, fungi, mycoplasma, cells lines, algae, protozoans, and nematodes indicated in the schedule. Further, those that are presently not known to exist in the country, or have not been discovered so far, are also included. It was considered that these require a separate set of regulations owing to the impact on India's scientific output of the industry that relies on the trade of these microorganisms. Rule 7(1) of these rules states that no person shall be allowed to import, export, transport, manufacture, process, use, or sell any hazardous microorganisms or genetically engineered organisms/substances or cells, except with the Genetic Engineering Approval Committee's approval.¹²¹ Further, according to Rule 11,¹²² food stuffs, ingredients in food stuffs, and additives including processing, which contain or consist of genetically engineered organisms or cells, cannot be produced, sold, imported, or used except with the Genetic Engineering Approval Committee's approval. In essence, therefore, aside from the regulatory powers available to the State and Central Pollution Control Board, an additional level of regulatory enforcement is available to the Genetic Engineering Approval Committee.

Additionally, the Rules also create the Review Committee on Genetic Manipulation. It has been vested with the authority to lay down procedures restricting or prohibiting the production, sale, import, and use of such genetically engineered organisms or cells, as are mentioned in the Schedule to the Rules.¹²³

Ozone Depleting Substances (Regulation and Control) Rules, 2000

With the advent of and growing activism regarding climate change and the acceptance of ozone depletion as the principal cause of global warming, the Government notified the Ozone Depleting Substances (Regulation and Control) Rules, 2000. Under these

¹²¹ Manufacture, Use, Import, Export and Storage of Hazardous Micro-Organisms Genetically Engineered Organisms or Cells Rules, 1989, Rule 7.

¹²² *Id.* Rule 11.

¹²³ Id. Rule 4.

rules, "consumption" in respect of ozone depleting substances is defined as including the imported consumption and excluding the exported consumption – creating a "net consumption" for calculation purposes.¹²⁴ These Regulations are stricter than other Regulations, placing a clear prohibition on trade with those countries not listed in Schedule VI of the Rules.¹²⁵ Rule 5 further provides the regulatory mechanism, which requires any trader to obtain a license to trade in ozone depleting products.¹²⁶ Regulation is also undertaken through Rule 10, which requires the trader to obtain a specific license to trade in products contained in column (2) of Schedule VII.¹²⁷As with other Rules, there is a reporting requirement to file returns with the Central Pollution Control Board on an annual basis, in the form specified in Schedule X.¹²⁸

MULTILATERAL AGREEMENTS RELATED TO TRADE IN CHEMICALS

International chemical trade started prior to the nineteenth century, with the discovery of sulfuric acid and the increase in demand for alkalis. The increasing demand for bleaching agents gave rise to the chemical industries in England and the United States of America. In the first half of the nineteenth century, developments in the field of chemistry led to artificial fertilizers being introduced to the world, paying the way for synthetic organic chemicals. Rubber was re-introduced as an industrial product. From the second half of the nineteenth century till World War I, dye manufacturing and trading was introduced, followed by the increasing demand for coal-tar products. Inventions like the cellphone and cameras used in photography started using chemicals heavily. This period also witnessed the dawn of plastic industry. Paints, perfumes, and fertilizers were introduced and traded around the world. The two World Wars pushed many chemical industries into distress, especially those that were primarily involved and impacted during the war like those in England, France, etc. The demand for nitrogen supplies and organic chemicals increased towards the end of World War I, and trade in combat gases was heightened. The demands for petrochemicals and tetraethyl lead increased, along with that of polythene. Countries like America, Britain, France, Belgium, Japan, etc., along with the Swiss city of Basel, grew heavily on the chemicals industry front. Petrochemicals and rubber, however, remained in high demand during the World War II.¹²⁹

¹²⁴ Ozone Depleting Substances (Regulation and Control) Rules, 2000, Rule 2(d).

¹²⁵ Id. Rule 4.

¹²⁶ *Id.* Rule 5.

¹²⁷ *Id.* Rule 10.

¹²⁸ Id. Rule 14.

 $^{129 \ \ {\}rm Fred} \ {\rm Aftalion}, {\rm A} \ {\rm History} \ {\rm of} \ {\rm The} \ {\rm International} \ {\rm Chemical} \ {\rm Industry} - {\rm From} \ {\rm the} \ {\rm Early} \ {\rm Days} \ {\rm to} \ 2000 \ (2d \ ed., 2001).$

New polymers were discovered post the World Wars, along with many chemical intermediates and high polymers. Agrochemicals were pushed for maximum trade around the world. The rise in German and American chemical industries, and the medical breakthrough with respect to chemicals, led to an increase in the global trade in chemicals. The nationalization of the chemical industry in France and Arab countries gaining a foothold in chemical trade impacted the global trade in chemicals. Biotechnology came into limelight, along with the development of the paint industry and the use of chemicals in electronics. The early twentieth century witnessed rapid advancements in science and technology. The pharmaceutical and agrochemical industries were primarily focused upon and heavily scrutinized. Oil, gas and chemical trade reached equilibrium, and international chemical trade prospered even with the constant existence of restrictions.¹³⁰ With the heightened use of chemicals in several sectors, the focus slowly shifted towards issues of human and environment safety, and eventually gave way to the promulgation of several multilateral agreements related to the trade in chemicals.

BASEL CONVENTION, 1989

The Basel Convention is a United Nations treaty and is formally known as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal. This convention was advocated to reduce and prevent the movement of hazardous and chemical wastes internationally, and the transfer of the same from developed countries to lesser-developed countries. It provides for the management of hazardous and chemical waste in the most environmentally viable manner.¹³¹ The convention defines a wide variety of wastes, hazardous wastes being defined fundamentally on their origin, configuration, and characteristics. To further the obligations under the Basel Convention, India notified two sets of Rules, i.e., the Batteries (Management & Handling) Rules, 2001 and the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008.

Batteries (Management & Handling) Rules, 2001

These Rules were put in place to manage the collection and recycling of lead-acid based batteries. It was enacted to prevent the potential environmental damage from the unregulated disposal of these batteries.

¹³⁰ *Id*.

¹³¹ Overview United Nations Environment Program, BASEL CONVENTION, http://www.basel.int/ TheConvention/Overview/tabid/1271/Default.aspx (last visited Sept. 19, 2020).

They apply to every manufacturer, importer, reconditioner, assembler, dealer, recycler, auctioneer, consumer and bulk consumer involved in the manufacture, processing, sale, purchase and use of batteries or components thereof. The responsibilities of an importer are contained within Rule 4.¹³² Aside from responsibilities to ensure the collection of used batteries and safe transportation and in addition to generating public awareness about the hazards of lead, importers must file a half-yearly return of their sales and buyback to with State Board. Additionally, they are responsible for placing the international recycling sign on their batteries. Rule 5 stipulates the manner in which importers are to be registered. It lists out the role of the Central Pollution Control Board, which shall grant a conditional registration for five years. Subsequent to such registration, Rule 6 lays out the conditions precedent to the customs clearance of imports. These are¹³³:

- (i) Valid registration with the Reserve Bank of India (with the Importer's Code Number);
- (ii) One time registration with the Ministry of Environment and Forests or an agency designated by it in Form-II;
- (iii)An undertaking in Form-III; and
- (iv) A copy of the latest half-yearly return in Form-IV.

As per the Rules, the importers, along with manufacturers and assemblers, are responsible for the disposal of these batteries and must arrange to collect these batteries from the customers.¹³⁴ The importers of lead-acid batteries are to register themselves with the Central Pollution Control Board.¹³⁵ The importers, along with other players like the manufacturers, assemblers, recyclers etc., must also submit half-yearly returns to the State Pollution Control Boards, as prescribed in the Rules.¹³⁶ Failing this, the registration of such importer would be liable to be cancelled.¹³⁷ Every importer of such batteries must have an Importer Code Number, along with being registered with the Ministry of Environment and Forests.¹³⁸

¹³² Batteries (Management & Handling) Rules, 2001, Rule 4.

¹³³ *Id.* Rule 6.

¹³⁴ Id. Rule 4.

¹³⁵ *Id.* Rule 5.

¹³⁶ Id. Rule 4(iii).

¹³⁷ Id. Rule 5(i).

¹³⁸ Id. Rule 6.

Recently, the Ministry of Environment, Forest and Climate Change, through a notification in the Official Gazette dated 20th February 2020, has issued the Draft Battery Waste Management Rules, 2020. These shall supersede the Batteries (Management and Handling) Rules, 2001. The current rules only apply to lead acid batteries. However, it is proposed that the fresh Rules shall apply to all types of batteries, in addition to appliances where a battery may be incorporated. The proposed changes for importers are not significantly different except for a proposed annual system of records under Rule 4 instead of a half-yearly system.¹³⁹

Hazardous Wastes (Management and Transboundary Movement) Rules, 2016

The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2016 have been framed under the Environment (Protection) Act, 1986. They were recently amended in 2020. These rules cover a range of stakeholders, including generators and regulatory agencies (such as the State Pollution Control Boards, State Governments and Central Government). Further, they define hazardous waste. They also create responsibilities in respect of the collection, transport, handling, treatment, and disposal of hazardous wastes, trying to create a framework at every step of the transport chain. More specifically, the rules prohibit, in express terms, the import of hazardous wastes for dumping and disposal. They create a consent/ permission system for the import of waste for reprocessing or reuse as raw material – with a contingent examination of the facilities provided for treatment, and the safe, environmentally-friendly disposal of any residue waste or other emissions that are created in the process.

The definition of "hazardous waste" under these Rules is broad. The definition is as under:

The term "hazardous waste" connotes any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances, and shall include-

- (i) waste specified under column (3) of Schedule I;
- (ii) waste having equal to or more than the concentration limits

¹³⁹ Battery Waste Management Rules, 2020.

specified for the constituents in class A and class B of Schedule II or any of the characteristics as specified in class C of Schedule II; and

(iii)wastes specified in Part A of Schedule III in respect of import or export of such wastes or the wastes not specified in Part A but exhibit hazardous characteristics specified in Part C of Schedule III

As is apparent, the Rules adopt a classification approach to hazardous wastes, creating three Schedules on the basis of the waste material's hazardous characteristics and properties. The obligations placed upon the stakeholder interacting with these wastes depend entirely on which Schedule the hazardous waste falls under. The definition also excludes from its purview certain types of waste, which are governed by separate Rules. These are:

- i) Waste arising out of the operation from Ships beyond 5 kms, as it is covered under the provisions of Merchants Shipping Act and the Rules thereunder;
- ii Radioactive waste, which is covered under the provisions of Atomic Energy Act, 1962 and Rules thereunder.

Chapter 3 of the Rules specifically deals with the transboundary movement of hazardous wastes.¹⁴⁰ The Ministry of Environment, Forests and Climate Change is the authority in charge of such movement.¹⁴¹ It also states that the license issued by the DGFT, along with the necessary permissions in writing from the Central Government, are paramount requirements¹⁴² for the imports and exports of hazardous wastes.

For importers specifically, there are specific guidelines laid down under these Rules. Firstly, the Ministry of Environment, Forest and Climate Change is established as the nodal ministry and authority to deal with the transboundary movement of the hazardous wastes, and to grant permission for the transit of the hazardous wastes through any part of India.¹⁴³ As per these Rules, the import of hazardous waste in to India from any country disposing it is strictly prohibited. Such waste can only be imported for recycling or recovery or reuse.¹⁴⁴

¹⁴⁰ Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2016, Rules 11-15.

¹⁴¹ *Id.* Rule 11.

¹⁴² *Id.* Rule 12.

¹⁴³ Id.

¹⁴⁴ Id. Rule 12(2).

In conformity with the classification of hazardous wastes that the Rules envisage, different conditions have been specified for the import/ export of different categories of waste. These may be summarized as follows:

- 1. The import of hazardous waste in Part A of Schedule III may be allowed to actual users with the prior informed consent of the exporting country and shall require the permission of the Ministry of Environment, Forest and Climate Change.
- 2. The import of other wastes in Part B of Schedule III may be allowed to actual users with the permission of the Ministry of Environment, Forest and Climate Change.
- 3. The import of other wastes in Part D of Schedule III will be allowed as per procedure given in Rule 13 and as per the note below the said Schedule.
- 4. No import of the hazardous and other wastes specified in Schedule VI shall be permitted.
- 5. The export of hazardous and other wastes from India, listed in Part A and Part B of Schedule III and Schedule VI, shall be with the permission of Ministry of Environment, Forest and Climate Change. In case of applications for the export of hazardous and other waste listed in Part A of Schedule III and Schedule VI, prior informed consent of the importing country shall also be required.
- 6. The import and export of hazardous and other wastes not specified in Schedule III, but exhibiting the hazardous characteristics outlined in Part C of Schedule III shall require prior written permission of the Ministry of Environment, Forest and Climate Change be.

Rules 13 and 14 laydown detailed procedures for the import and export of hazardous waste. Rule 13 is specific to importers. It provides that the importer must apply to the Ministry of Environment, Forest and Climate Change for the proposed import, along with obtaining the prior informed consent of the exporting country. Further, it must send a copy of this application to the State Pollution Control Board. The Board shall submit an acknowledgment and information to the MoEF&CC. It is only in respect of wastes that are listed in Part D of Schedule III that no consent of the MoEF&CC is necessary. However, in line with import regulations, Customs Authorities must be presented with the relevant Form-6. All of these consent requirements are in accordance with the Basel Convention. The procedure requires that the MoEF&CC

forward the consent/permission to the Ports and Customs authorities, the Central Pollution Control Board and the concerned State Pollution Control Board, which shall subsequently monitor the circumstances. Additional obligations imposed upon the importer include the filing of an annual return with the State Pollution Control Board to ensure adequate oversight.

With respect to the exports of hazardous waste from India, the exporter is required to submit to the Central Government, along with other documents, the Prior Informed Consent from the importing country in writing.¹⁴⁵ The importers, on the other hand, are required to submit, 60 days prior to the arrival of shipment, the details of the shipment. Further, they must register themselves with the CPCB and seek permission from it and the SPCB concerned, and fulfill all formalities under the Customs Act, 1962.¹⁴⁶ Circumventing any of the requirements under the rules would render the import and export to be termed as illegal traffic, resulting in the prescribed penal actions.¹⁴⁷

The Rules also elaborate on circumstances that would render the transboundary movement of hazardous wastes illegal. These are:

- (i) It is without permission of the Central Government in accordance with these rules; or
- (ii) The permission has been obtained through falsification, misrepresentation or fraud; or
- (iii)It does not conform to the shipping details provided in the movement documents; or
- (iv) It results in deliberate disposal (i.e., dumping) of hazardous or other waste in contravention of the Basel Convention and of general principles of international or domestic law.

The Rules also provide for the treatment, storage, packaging, labeling and transport of the hazardous wastes. Under Schedule I of the Rules, a list of processes generating hazardous wastes is given.¹⁴⁸ Part A of Schedule III contains a list of wastes, the

¹⁴⁵ *Id.* Rule 13.

¹⁴⁶ Id. Rule 14.

¹⁴⁷ Id. Rule 15.

¹⁴⁸ Id. Rule 3(1).

import of which require prior informed consent.¹⁴⁹ Part B contains a list of those that do not need prior informed consent.

Despite the Supreme Court order affirming the ban on hazardous waste imports, there has been illegal traffic in India. In *Research Foundation for Science Technology National Resource Policy* v. *Union of India and Ors.*,¹⁵⁰ the Court directed that no authorization or permission would be given by any authority for the import of hazardous waste items which have already been banned by the Central Government, or by any order made by any Court or any other authority, or under the Basel Convention, or to be banned thereafter with effect from the dates specified therein.¹⁵¹ The Supreme Court has identified two situations relating to illegal import consignments: firstly, illegally imported wastes that have been cleared and have already found their way into the market. In respect of this category of illegal imports, the Court directed that "action against all concerned shall be taken by the concerned authorities in accordance with law". The second situation relates to the stock of such wastes lying at various ports, or at Indian Container Depots or Container Freight Stations.

In furtherance to the above division made by the Supreme Court of India, legislations related to handling of waste can be further divided into two categories. *Firstly*, those banned under the Hazardous Waste Rules as amended up to date and *secondly*, those falling under a banned category in terms of the Basel Convention, i.e., generation, collection, receipt, storage, transport, treatment, disposal, or handling of biomedical waste. Locally, bio-medical wastes are governed under Biomedical Waste (Management and Handling) Rules, 1998. Under these Rules, Biomedical Wastes include wastes that are generated during (1) the diagnosis, treatment, or immunization of human beings or animals; (2) related research activities; or (3) the production or testing of biologicals.¹⁵² They do not contain provisions pertaining to the import or export of any biomedical waste. What should be noted however is that it creates obligations for the transporter of biomedical waste. These obligations include the requirement to obtain the permission of the concerned State Pollution Control Board (the prescribed authority under those regulations) and file annual reports with the Board.¹⁵³

¹⁴⁹ Id. Rules 3, 14 & 15.

¹⁵⁰ Research Foundation for Science Technology National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (civil) No. 657 of 1995, decided on 5 May 1997 (SC).

¹⁵¹ *Id.* ¶ 62.

¹⁵² Biomedical Waste (Management and Handling) Rules, 1998, Rule 3(6).

¹⁵³ Hazardous Wastes (Management and Transboundary Movement) Rules, 2016, Rule 7.

Waste that is covered under the Solid Waste Management Rules, 2015, is also excluded from the purview of the Hazardous Waste Management Rules. Under these Rules, solid waste is defined as including commercial and residential wastes generated under a local authority in either solid or semi-solid form, excluding industrial hazardous wastes but including treated bio-medical wastes.¹⁵⁴

This definition informs us that hazardous waste is excluded from the purview of these Rules. The focus of these Rules is extensively on the obligations of local authorities responsible for solid waste management at that level of governance. It does not specify any obligations for importers or delineate any responsibilities to importing authorities.

Rotterdam Convention, 1999

This is a United Nations multilateral treaty relating to the import of hazardous chemicals and the responsibilities of those involved in such trade. It is formally called the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.¹⁵⁵ The Convention promotes labeling¹⁵⁶ and safe handling instructions¹⁵⁷ to be made and given by the exporters and encourages the exchange of information related to the chemicals being exported and imported. The importing country has the choice to import certain chemicals, primarily pesticides and industrial chemicals, into its jurisdiction, subject to the environment impact that chemical is likely to have. Annexure III of the Convention provides a list of 52 chemicals that have been banned, or highly regulated, by the parties to the Convention.¹⁵⁸

India brought about the ITC (HS), i.e., Indian Trade Classification (Harmonized System), discussed above, under the Foreign Trade (Development & Regulation) Act, 1992. Schedule I of the list specifically restricts certain chemicals, subject to fulfillment of the Prior Informed Consent procedure as provided for under the Rotterdam Convention.

¹⁵⁴ Solid Waste Management Rules, 2015, Rule 3(46).

¹⁵⁵ *Overview*, ROTTERDAM CONVENTION (September 19, 2020) http://www.pic.int/TheConvention/Overview/ tabid/1044/language/en-US/Default.aspx.

¹⁵⁶ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade art. 13, Sept. 10, 1998, 38 ILM (1999).

¹⁵⁷ Id. art. 15.

¹⁵⁸ Id. art 5 and Annex III Chemicals.

Chemical Weapon Convention, 1993

Administered by the Organisation for the Prohibition of Chemical Weapons, the convention is formally known as Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction.¹⁵⁹ The Convention specifically talks about the production and movement of chemical weapons.¹⁶⁰

India, in furtherance to this convention, has enacted the Chemical Weapons Convention Act, 2000. The Act mandates that the foreign trade in chemicals found in Schedule 1 to 3 of the above-mentioned convention must take place only as provided for under the Foreign Trade Policy formulated by the Central Government under the Foreign Trade (Development and Regulation) Act, 1992.¹⁶¹ The Act also provides for the registration of persons engaged in the production of chemicals under it.¹⁶² The Act empowers the inspector to inspect, search and seize goods that violate the provisions of the Act,¹⁶³ along with containing penal provisions for importers and exporters in case of contravention of the Act.¹⁶⁴

Stockholm Convention, 2001

This is a United Nations treaty relating to the environment and is officially called the Stockholm Convention on Persistent Organic Pollutants (POPs). As the name suggests, this Convention deals with bans and restrictions on the manufacture and utilization of persistent organic pollutants that are hazardous to the environment and human health.¹⁶⁵ Annexure A of the Convention lists out the POPs that are prohibited and/ or eliminated from production, and from being imported and exported. Chemicals in Annexure B, on the other hand, are completely restricted from being imported and exported and exported.¹⁶⁶ The Convention also provides for safe disposal of the wastes generated by such POPs.¹⁶⁷

167 Id. art. 6.

¹⁵⁹ Mission, OPCW, https://www.opcw.org/about-us/mission (last visited Sept. 19, 2020).

¹⁶⁰ Convention on the Prohibition of the Development, Production, Stockpiling and use of Chemical Weapons and on their Destruction, Sept. 3, 1992, 1975 U.N.T.S. 45.

¹⁶¹ The Chemical Weapons Convention Act, 2000, § 17.

¹⁶² *Id.* § 18.

¹⁶³ Id. §§ 19-38.

¹⁶⁴ *Id.* § 43.

¹⁶⁵ *Overview*, Stockholm Convention, http://www.pops.int/TheConvention/Overview/tabid/3351/Default. aspx (last visited Sept. 19, 2020).

¹⁶⁶ Stockholm Convention on Persistent Organic Pollutants art. 3, May 17, 2004, 2256 U.N.T.S. 119.

In furtherance to this Convention, India came out with the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 and the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 hereinabove explained. The provisions of the Insecticides Act, 1968 were also aligned accordingly. Under the Insecticides Act, provision has been made for the establishment of a Registration Committee by the Central Government to register and verify the environmental and human impact of insecticides, as per the claims in the import documents or manufacturer.¹⁶⁸ An importer or manufacturer of insecticides is required to register with the Registration Committee.¹⁶⁹ The Act also prohibits imports and manufacture of certain insecticides¹⁷⁰ and those on the ground of public health and safety.¹⁷¹

The LIRA Guidance

The UN Environment Guidance on the Development of Legal and Institutional Infrastructures and Measures for Recovering Costs of National Administration for Sound Management of Chemicals (the LIRA Guidance) is another key document. This focuses exclusively on managing chemicals at every step of their life-cycle. Like the Cairo Guidelines, the aim of the LIRA Guidance is to assist States in developing their national policies on the domestic treatment of chemicals. Another key goal is to provide the tools necessary to ensure sustainable financing of chemical management to help developing States in particular.¹⁷² The objectives of the LIRA guidance can be summarized as follows:

- 1. To support countries in reviewing all of their legal and institutional infrastructures, and to establish sustainable legal and institutional frameworks for the sound management and disposal of chemicals;
- 2. To propose options for organizing these created legal and institutional infrastructures governing the placement of chemicals on the market and the manner in which trade is to be carried out;
- 3. To identify those key elements which are to be considered by States in developing legislation when it comes to chemical trade;

¹⁶⁸ The Insecticides Act, 1968, § 5.

¹⁶⁹ *Id.* § 9.

¹⁷⁰ *Id.* § 17.

¹⁷¹ *Id.* § 27.

¹⁷² *LIRA Guidance*, UNITED NATIONS ENVIRONMENT PROGRAM (Sept. 12, 2015), https://www.unep.org/resources/ report/lira-guidance.

4. To provide tools to ensure the sustainable financing of chemical trade.

There are two parts to the LIRA Guidance. The first focuses on legal and institutional infrastructure, while the second focuses on cost recovery. The aim of guidance on legal and institutional infrastructure is to ensure the sound construction of the same – in terms of adopting a clear delineation of obligations and responsibilities of all the affected stakeholders while ensuring inter-sectoral communication. As regards cost recovery, the guidance states that effort ought to be made to minimize the infrastructure cost upfront, while ensuring transparency by engaging with a range of stakeholders to convey net benefits and cover design issues and political acceptability.

The LIRA Guidance has the ambition of creating a comprehensive chemical management system, which seeks to manage chemicals at every point in their lifecycle. In doing so, they aim at better implementing the Stockholm, Rotterdam, and Basel Conventions.

CONCLUSION

With the import of organic chemicals amounting to nearly one trillion rupees in fiscal year 2019, chemical imports amounted to close to 9 percent of all imports in that year,¹⁷³ while the exports in chemicals had a growth of 21 percent during the same year. The Chemicals and Petrochemicals Secretary had recognized, in mid-2019,the need to add to the utilization in chemical industry and reduce unwanted imports especially those under petrochemicals. The Indian Government has been looking at developing the sector to focus on domestic production.¹⁷⁴ With the global pandemic and the rise in Indian pharmaceutical industry, one would hope that the global trade in chemicals would turn in the favour of India. However, the caution remains in place regarding the compliance with all legal provisions, and a concern towards the health and safety of both human and that of the environment.

¹⁷³ DEPARTMENT OF COMMERCE, MINISTRY OF COMMERCE AND INDUSTRY, ANNUAL REPORT 2018-2019 (2020).

¹⁷⁴ Government Looks to Cut Down Imports of Chemicals, Make India Manufacturing Hub, ECONOMIC TIMES (Aug. 21, 2019), https://economictimes.indiatimes.com/industry/indl-goods/svs/chem-/fertilisers/government-looks-to-cut-down-imports-of-chemicals-make-india-manufacturing-hub/ articleshow/70774599.cms?from=mdr.

CHAPTER 3

LABELLING REQUIREMENTS OF CHEMICALS IN INDIA

INTRODUCTION

The use of chemicals is inevitable in the economic space with great importance across numerous industries as several vital industries use chemicals as their raw material. The primary chemical-dependent industries include textile, paper, paint, detergent, soap, personal healthcare, agrochemicals (fertilizers, insecticides, pesticides) pharmaceuticals, bulk drugs and formulations etc. Many of the chemicals used in these industries, if not handled carefully, can pose a potential safety risk to the individual and society at large. Hazardous chemicals, for example, are often used in these industries. If they are not managed, stored, used, and disposed off properly, they can cause significant damage to public health and environment, as these chemicals are highly prone to cause incidents like fire, explosion, pollution etc. Hence, with the increased usage of chemicals and chemical products and the potential risk they can pose to environment and health, it becomes essential to develop a system of measures that ensures proper handling, disposal and usage of the chemical products.

Chemical Management across the world is based on a combination of international, regional and national mechanisms. There is a plethora of instruments at the international level that lay down principles of chemical governance and management (such as GHS and SAICM). At the national level, several countries have introduced legislations and employed administrative measures to regulate the chemical industry. These measures have been developed along the lines of the common law principles laid down by courts (the law on nuisance, for example). However, the subject of chemical hazard and waste management as a specialised branch of law has developed quite recently.¹

As the risks associated with manufacturing, transporting, handling and disposal of certain chemicals are very high, the whole life cycle of chemicals is required to be dealt with prudence and caution, ensuring due diligence to minimise the possibility

¹ Balaji G, Potdar Aditee & Unnikrishnan Seema, *Environmental Legislation for Chemical Management in India: An Agenda for Reforms*, 9 J. ENVIRON. Res. DEVELOP. 494, 494-506 (2014).

of harm. In this regard, the labelling requirements as a regulatory mechanism serve the purposes mentioned above in a simple but effective way.

NEED FOR LABELLING

Environmental

With the growing utilization and inclusion of these chemicals in our daily lives, the risk associated with their disposal and spillage has increased severely impacting the environment. With the export and import of chemicals being rampant, there is a need to minimise the impact on environment.

- There are umpteen cases wherein a chemical, which was not properly handled, has had a devastating effect on the environment because it ended up being released.
- A uniform mechanism is essential and more effective in terms of the help it can bring up. With the depletion of the Ozone Layer and effect of the Green House Gases, there is an immediate need to take action and ensure that measures are taken to bring in the requisite safeguards.
- These are only a few but significant examples where incorrect handling has resulted in more harmful effects for wildlife and environment, like poisoning of rivers and oceans by wrong release of toxins into them, affecting the marine life and people that consume fish or seafood.
- The growth of these horrific accidents led to a need for international and national regulations dealing with chemicals, specifically labelling, to ensure awareness of the handling, storage and disposal of them without adversely affecting the environment.

Adverse Effect on People

There are multiple cases of skin burn, cancer and other horrific diseases resulting from improper or inadequate labelling. To ensure that no harm comes to the people involved in handling of chemicals:²

• There is a need for general warning of the chemical's effects and a need to take necessary precautions. There is a need for prudence on part of companies, however, it is also the duty of the legislative bodies (international & national) to come up with mechanisms to mandate these norms.

² International Labour Organisation (ILO) Convention 170, Chemicals Convention, 1990.

• The various labels used for hazardous chemicals help in identifying the kinds of dangers that are associated with the respective chemical. In addition to that, labels also provide instructions for their safe usage, handling and disposal. Using this information, businesses can ascertain the type of safety controls required at the workplace and offer the requisite training to workers to safely deal with the chemical. It is the duty of manufacturers, suppliers, importers and businesses that use chemicals to ensure that they are labelled correctly, so that the workers using them are aware of the hazards.

Classification

Labelling also helps in classifying and segregating hazardous chemicals properly for ensuring the requisite safety and health standards.³ The classification process starts with identifying the physical and chemical properties of the chemicals and their health and environmental effects. Once the associated risks and hazards are identified, this information should be communicated through the hazard label for proper packaging, handling, usage etc. In this relation, the appropriate label should be able to communicate the following aspects:

- i. Name, address and telephone number of supplier(s);
- ii. Product identifiers;
- iii. Hazard pictogram;
- iv. Hazard statement(s) and description of the hazardous effect;
- v. The appropriate precautionary statement which can guide the user to take necessary measures for protection of health and environment;
- vi. Nominal quantity (when the chemical is supplied to the general public); and
- vii. Supplemental Information.

LABELLING REGULATIONS IN THE INTERNATIONAL SCENARIO

Concerted efforts to manage and reduce the risks associated with usage of hazardous chemicals at the international level have gradually led to the emergence of 'international chemical regime', which comprises of both 'hard' and 'soft' international law such as

³ UNITED NATIONS, GLOBAL HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS) (4th ed., 2011) [hereinafter GHS].

treaties and convention,⁴ in order to have a proper understanding of the labelling requirement mechanism. It is pertinent to study and understand these international instruments that have been brought into place to ensure standardisation and better ways of dealing with hazardous chemicals. International treaties and conventions relating to chemicals, that comprise 'hard' international law are mostly directed towards regulating specific substances (or group of substances) or are intended to regulate particular activities such as trans-boundary movements of hazardous waste. However, it is pertinent to note that the number of chemicals that are regulated through international treaties is very minimal as compared to the actual number of such chemicals available in the market.⁵

Rotterdam Convention

The Rotterdam Convention of 1998 is one of the primary international treaties that deal with the regulation of chemicals. It aims to protect human health and environment from the potential harm associated with hazardous chemicals through a mechanism of shared responsibility and is intended to promote co-operative efforts among parties by regulating the international trade of certain hazardous chemicals. It also aims to contribute towards providing a mechanism for 'environmentally sound use' of such chemicals.⁶ The primary focus of the Rotterdam Convention is monitoring the import and export of hazardous chemicals and pesticides. To ensure that correct information is communicated during the import and export of chemicals, the Rotterdam Convention also makes certain labelling provisions.

Article 13 of the Convention mandates the provision of information when exporting chemicals listed in Annex III of the Convention. It also empowers the importing country to make other dangerous chemicals (not part of Annex III) subject to mandatory labelling requirements with adequate information. The labelling requirement provisions are intended to ensure that the relevant and proper information related to risks and hazards to human health or the environment, after having taken into account relevant international standards, is communicated to the importing party. On a softer law side, the Article also requires the Conference of Parties to pursue development of 'specific Harmonized System Custom Codes' from the World Custom's Organisation.

⁴ P. Wexler, et al (eds.), Chemicals, Environment, Health: A Global Management Perspective (2011).

⁵ UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP), GLOBAL CHEMICALS OUTLOOK, TOWARDS SOUND MANAGEMENT OF CHEMICALS (2013).

⁶ The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in Internatinal Trade art. 1, Feb. 24, 2004, 2244 U.N.T.S. 337.

Despite the Convention covering the requirement of Adequate Labelling, the provisions are rather vague. Mere statement of having information regarding hazards to human health and environment is left to interpretation and creates ambiguity. It would have been prudent if the Convention went into the necessary details and did not merely leave it at multiple languages in case of export.

International Labour Organisation (ILO) Convention 170

Also known as the Chemicals Convention, 1990, the ILO Convention 170 is a move by the ILO to ensure that better standards are implemented by organisations dealing with chemicals. It came due to the increase in cases of accidents and illnesses that occurred when labourers dealt with Chemicals.

The critical points of the Convention are as follows:

- It mandated that (i) Chemicals should be evaluated to determine associated hazards; (ii) Employers should be provided with a mechanism for obtaining information from the supplier about the chemicals used at work, using which they can implement effective programmes for protection of workers from chemical hazards;⁷(iii) Workers should be provided with the required information regarding the chemicals at their workplaces and should be trained with the appropriate preventive measures to make their participation in the protective programmes to ensure safe usage of chemicals.
- Article 7 of the Convention provides that chemicals should be adequately marked and proper labelling should be done to ensure that necessary information regarding their classification, associated hazards and required safety precautions is observed and easily understood by the workers.
- After adequate labelling, the task was left to the "competent authority" to deal with the matter in detail. However, this did not fully accomplish the goal the Convention set out to achieve. It was important for guidelines to be set out and implemented to draw out the necessary information added in the label.

Agenda 21-Commission for Sustainable Development (UN)

The 1992 conference in Rio was primarily focused on environmental safeguards to ensure that adequate protections are put into place so that developmental activities

⁷ GHS, *supra* note 3.

do not prove harmful to the environment. Agenda 21 also made provisions regarding labelling for chemicals.

- Under paragraph 19.26, a concern was expressed regarding the lack of any global harmonised labelling system and a need to develop harmonized hazard classification and labelling systems.
- Chapter 4, under paragraph 14.75, talked about pesticides being appropriately labelled to ensure safety to farmers.

Agenda 21 helped set the pace and need for development of the Global Harmonised System (GHS) to provide more details and move away from the existing vague provisions. However, it required the implementation aspect to be discussed in detail, leaving the system as is and waiting on a harmonized system. It was a long haul and the Agenda could have helped set out certain specific provisions, prior hand, for safety of the people and environment.

Global Harmonised System (UN)

System of Classification and Labelling of Chemicals (GHS) is an international system that provides for the classification and labelling of chemicals according to their nature and severity of hazards associated with them. It also specifies how information about risks should be communicated to users in hazard pictograms, hazard statements and Safety Data Sheets.⁸ The need for a unified global system was long due. It was first raised in Agenda 21, concerning the unsustainable management of chemicals that have considerable risks for human health and ecosystems.⁹

- The primary aims of GHS are:
 - i. Promoting regulatory efficiency.
 - ii. Facilitating trade.
 - iii. Easing compliance.
 - iv. Reducing costs.
 - v. Providing improved, consistent hazard information.

9 Id.

⁸ *GHS Implementation,* UNECE, http://www.unece.org/trans/danger/publi/ghs/implementation_e.html (last visited May 23, 2020) [hereinafter GHSSC].

- vi. Encouraging the safe transport, handling and use of chemicals.
- vii. Promoting better emergency response to chemical incidents.

viii. Reducing the need for animal testing.

- Regarded as one of the cornerstones of sound chemical management, the GHS aims to promote greater sustainability in the production and use of chemicals. Having such a system in place helps employ best-practices in handling, storing and disposing off chemicals. The primary goal of the GHS is to identify the intrinsic hazards that can arise from chemical substances and mixtures and convey this information in a harmonized manner. The classification criteria have been reconciled to achieve this objective by standardizing hazard statements, symbols and signal words and by forming an integrated hazard communication system. It also deals with emergency responses, transportation and consumer aspects of hazardous chemicals.
- Under GHS, the hazards associated with chemical products are defined and classified, and this information related to health and safety is communicated on the respective labels and data sheets.
- The critical component of a GHS label includes the following:
 - i. **Label Elements** –Label elements under GHS include symbol, signal word and hazard statement assigned to respective hazard category of the GHS. Details of label elements are provided for each hazard class, which is reflective of the harmonized criteria for classification.
 - ii. **Pictograms and Reproduction of the Hazard Pictograms** Pictogram is another component of the Label under the GHS. It is a graphical composition that includes the symbol and other graphic elements also, such as border, background pattern or colour. All these elements are meant to convey specific information. Some of the pictograms under the GHS are illustrated in figure 1.
 - iii. **Shape and Colour** All hazard pictograms in the GHS are required to be in the shape of a square set at a point.¹⁰
 - iv. **Signal Words** Indicate the relative level of severity of hazard and alert the reader of a potential hazard through the label. Two of the standard signal

¹⁰ GHS, supra note 3.

words used in GHS are 'Danger' and 'Warning'. Danger is used when the chemical comes under severe hazard category (i.e. hazard categories 1 and 2), whereas, for lesser severe categories, the signal word 'warning' is used.¹¹

- v. **Hazard Statements** These are standard phrases assigned to a particular hazard class and category to describe the nature and degree of hazard related to the product.
- vi. **Precautionary Statements and Pictograms** A GHS label is required to convey appropriate precautionary information. This is achieved by using specific phrases and/or pictograms on the GHS. These precautionary statements or pictograms describe the recommended measures that should be taken to minimize or prevent the harmful effects resulting from exposure, improper storage or handling of hazardous products.
- vii. **Product Identifier** It is a particular name/number that is used for a hazardous chemical. The product identifier provides a unique way for the identification of the chemical by the user. The product identifier used on a GHS label must match with the product identifier used on the Safety Data Sheet (SDS).¹²
- viii. **Supplier Identification**–A GHS label should also contain the contact information of the supplier, which includes: name, address and telephone number of the manufacturer or supplier of the substance or mixture.

Safety Data Sheet¹³ (SDS) is an integral component of the GHS. This document serves as a comprehensive source of information relating to chemical substance or mixture. It is intended to provide workers and emergency personnel with the required information regarding the safe handling of chemical substances in their workplace. Information in SDS should be presented using the sixteen headings in order, which are as follows: (i) Identification; (ii) Hazard(s) identification; (iii) Composition/ information on ingredients; (iv) First-aid measures; (v) Fire-fighting measures; (vi) Accidental release measures; (vii) Handling and storage; (viii) Exposure controls/ personal protection; (ix) Physical and chemical properties; (x) Stability and reactivity; (xi) Toxicological information; (xii) Ecological information; (xiii) Disposal

¹¹ GHSSC, *supra* note 8.

¹² GHS, *supra* note 3.

¹³ Id.

considerations; (xiv) Transport information; (xv) Regulatory information; (xvi) Other Information.



Figure 1: Elements of a GHS Label

• The above picture is an example of how an appropriate GHS Chemical Labelling tag would look like.¹⁴ It contains a pictogram, signal word, hazard statement, precautionary statement and product & supplier identifier.

The GHS was a significant move in dealing with the labelling needs in-depth and providing for an appropriate basis and standard for global compliance and adoption by national legislative bodies. The two main components were classification and identification of chemicals and passing on of information.¹⁵ The TSCA (US) and ECHA (EU) both had adopted the GHS standards and have partially or fully implemented it. As of 1 April 2017, GHS has been adopted and fully implemented by 50 countries (i.e. 26% members of UN) in their national legislations, it has been partially implemented by 15 countries (8% of UN membership) and 128 countries (66%) are yet to implemented the GHS.¹⁶ To ensure a much widespread implementation of the GHS, there must be an increased regional collaboration. New actors should be brought in to specifically deal with it, support improved regulatory measures and improve general financial capacities.¹⁷

¹⁴ Globally Harmonized System (GHS) Labelling Requirements - How to comply to the HazCom 2012 Standard, BRADY INDIA, https://www.bradyindia.co.in/applications/ghs-labeling-requirements (last visited May 23, 2020).

¹⁵ GHSSC, supra note 8.

¹⁶ *Id*.

¹⁷ Brady India, *supra* note 14.

UN Model Regulations on Transport of Dangerous Goods (TDG)

The United Nations Economic and Social Council's Committee of Experts on the Transport of Dangerous Goods adopted a first version of the "Model Regulations on the Transport of Dangerous Goods," which were annexed to the tenth revised edition of the Recommendations on the Transport of Dangerous Goods.

With the significant growth in global use and transport of chemicals, it was pertinent to ensure consistency between various regulatory systems. Hence, the United Nations has developed Model Regulation TDG mechanisms to harmonize hazard classification criteria, communication tools and transport conditions for all modes for transport. To ensure effective implementation of these mechanisms, the UNECE also administers regional agreements that deal with transporting dangerous goods through road, rail and inland waterways.¹⁸ Some of the key points relating to Model regulations are as follows:

- Under the Model Regulations, hazardous substances are classified into 9 distinct classes. Each of the classes has its different pictogram. Further, each class has its own UN Number, proper shipping and packaging requirements.¹⁹
- The TDG regime mandates that packages containing dangerous goods should be marked and labelled before they are assigned for shipment.²⁰ TDG makes a distinction between marking and labelling in the following terms:
 - i. **Marking:** relates to UN number, proper shipping names, UN specification marks and other markings, if applicable, (such as orientation arrows, environmental hazardous substances mark for UN 3077 and UN 3082 and excepted quantities mark);



Figure 2: Symbols for transport of dangerous goods

- 18 Dangerous Goods, UNECE, https://www.unece.org/fr/trans/danger/danger.html (last visited May 25, 2020).
- 19 Introduction to TDG, CHEMSAFETYPRO, https://www.chemsafetypro.com/Topics/TDG/Introduction_to_ the_transport_of_dangerous_goods_TDG.html (May 25, 2020).

20 Id.

ii. **Labelling:** relates to hazard symbols (and handling labels) displayed on small means of packages (usually less than 450 litres);²¹

Figure 4 below illustrates marking and labelling of a dangerous goods package



Figure 3: Marking and labelling of dangerous goods for transport

LABELLING REQUIREMENTS FOR CHEMICALS IN INDIA

India has nearly more than 20 different legislations dealing with chemical management and is in the process of developing a succinct policy in terms of strictly dealing with the labelling of hazardous chemicals. It is noteworthy that India has neither partially nor fully been able to implement the GHS.

India has enacted regulations for regulation, manufacture, storage, usage, handling, transportation, import-export, recycling, disposal and waste management. The need to protect consumer interest, environment and public health is also a key concern in Indian regulatory regime. However, it is evident that the mandates towards the Labelling requirements are at a very nascent stage in India and a more rigorous law is required to comply with the GHS standards.

Manufacture, Storage and Import of Hazardous Chemical Rules, 1989: The Rules were made by the Ministry of Environment and Forests (MoEF) in the year 1989²² under the rule-making powers conferred by Section 6, 8, and 25 of the

^{21 1} United Nations, Recommendations on the Transport of Dangerous Goods, Model Regulations (21st ed., 2019).

²² The Rules were later amended in the year 1994 and 2000.

Environment (Protection) Act, 1986. The Rules regulate the manufacture, storage and import of hazardous chemicals in India. For transportation and carriage of hazardous goods, the requirements laid down by the Motor Vehicles Act, 1988 are also required to be met.²³ The salient features of the Rules are as follows:

- For the purpose of regulation, hazardous chemicals are segregated into 3 schedules.²⁴ Schedule 1 classifies chemicals as hazardous based on a threshold quality level of toxicity, flammability and explosivity. Schedule 2 and Schedule 3 list chemicals based on a certain threshold quantity.
- The "occupier" of any industrial activity that involves schedule 1 chemicals has the following responsibilities under the Rules.²⁵
 - i. Identification: He has to identify major accidents and hazards associated with such industrial activity/chemicals.
 - ii. Due Diligence: He has to take adequate steps to prevent those accidents and also has to take steps to limit the consequences of such accidents on persons and the environment.
 - iii. Ensure Worker Safety: the occupier has to ensure that the persons working on the site are provided with the necessary information, training and equipment (including antidotes) to ensure their safety.²⁶
 - iv. Provide Evidence: the occupier has to provide evidence that he has carried out the responsibilities mentioned in (i) to (iii).

It is pertinent to note that the rules do not restrict the scope of the above duties to the 'owner' of the premises only but they have broadened its scope to make the 'occupier' of the premises liable even if he is not the owner. However, the occupier should have 'control' of the industrial activity for these duties to apply. Further, in case any major accident occurs, the occupier has to notify the concerned authority within 48 hours.²⁷

²³ Overview of Chemical Regulations in India and Latest Developments, CHEMSAFETYPRO, https://www. chemsafetypro.com/Topics/India/Overview_of_Chemical_Regulations_in_India.html (last visited May 25, 2020) (for instance, Section 146 of the MVA, 1988 prescribes that there should be a policy of insurance under the Public Liability Insurance Act, 1991 for a vehicle that carries or is meant to carry dangerous or hazardous goods. Also, under Section 79, the Regional Transport Authority is empowered to prescribe "conditions relating to packaging and carriage of goods of dangerous or hazardous nature to human life" as one of the conditions for granting a goods carriage permit).

²⁴ Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, Rule 2(e).

²⁵ Id. Sch. 1.

²⁶ *Id.* Rule 4.

²⁷ Id. Rule 4(1).

He also has to obtain or develop the information specified in Schedule 9 of the Rules in the form of a "Safety Data Sheet." This safety data sheet should be made accessible upon request/reference.²⁸

- With regard to labelling, Rule 17(4) prescribes that every container which contains a hazardous chemical shall be labelled or marked clearly so that the following can be identified clearly:
 - i. The contents of the container;
 - ii. The name and address of manufacturer or importer of the hazardous chemical;
 - iii. The physical, chemical and toxicological data as per the criteria given in Part I of Schedule 1.

However, while considering the size of the container or the nature of the package, if it is impracticable to label the chemical, then Rule 17(5) prescribes making provisions for providing other effective means like tagging or accompanying documents.²⁹

- Section 18 of the Rules deals with the imports of hazardous chemicals in India. Rule 18(2) prescribes that any person who is responsible for importing hazardous chemicals of Schedule 1 is required to give a 30 days' notice prior to the date of import to the Chief Controller of Imports & Exports, for importing Schedule 1 hazardous chemicals in India. In this notice, the following information should be provided:
 - i. Name & address of the person receiving the consignment in India;
 - ii. The port of entry in India;
 - iii. Mode of transport from the exporting country to India;
 - iv. The quantity of chemical(s); and
 - v. Complete product safety information.³⁰
- Schedule 2 and Schedule 3 of the Rules lists down hazardous chemicals on the basis of a threshold quantity. If a site is storing or handling those chemicals above the threshold limit, it will be classified as a major accident hazard (MAH) installation and would be subjected to reporting, safety audit and contingency plan

²⁸ Id. Rule 17.

²⁹ *Id*. Rule 17(5).

³⁰ *Id.* Rule 18.

requirements.³¹ After notification, the obligation shifts to the competent authority to notify the Port Authorities regarding the handling and safety procedures of the incoming hazardous substance.

- Schedule 9 of the Rules deals with the requirements of the **Safety Data Sheet** (SDS).³² This schedule has 10 heads which mandate provisions of information regarding the following:
 - i. Chemical Identity: Under this head, information such as chemical name & classification, synonyms, trade name, formula, CAS No., UN No., Hazardous Waste I.D No., Hazardous Ingredients etc. have to be provided.
 - ii. Physical and Chemical Data: Under this head, information relating to Boiling Point, Melting Point, Freezing Point, Physical state, Appearance, Vapour Pressure, Odour, Vapour Density, Solubility, pH level, etc. have to be provided.
 - iii. Fire and Explosion Hazard Data: Under this head, the SDS has to disclose the flammability, flashpoint, auto ignition temperature, explosion sensitivity to impact and electricity, etc.
 - iv. Reactivity Data: The SDS under this head has to provide the chemical stability, incompatibility with other materials, reactivity, etc.
 - v. Health Hazard Data: Under this head, one can find the information relating to entry routes, effects of exposure and related symptoms, emergency treatment, permissible exposure limits, and hazard signals.
 - vi. Preventive Measures Section: This includes information relating to protective equipment worn by personnel and handling and storage precautions.
 - vii. Emergency and First Aid Measure: Under this head, information regarding steps to be taken in case of emergencies such as fire, exposure, spills have to be provided. This information includes media used for extinguishing the fire, procedure to be followed, first aid measures in case of exposure, antidotes/ dosages, waste disposal methods, etc.
 - viii. Additional Information/ References: Under this head, the SDS can provide any additional information of references other than those mentioned in the earlier heads relating to the chemicals safe handling.

³¹ Id. Sch. 2 & 3.

³² Id. Sch. 9.

- ix. Manufacturer/ Supplier Data: In this section of the SDS, information related to the manufacturer or supplier is provided. This information includes the Name of the firm, Mailing Address, Emergency Contact, Local bodies involved, etc.
- x. Disclaimer: Under this head, a disclaimer is provided relating to the reliability of the information provided in the safety data sheet.
 - The issue with the above SDS requirement is that the rules are old. However, with the coming of GHS, current mandate and practice of making companies having the SDSs to comply with GHS standard and cover the above-required information has made them more than sufficient.
 - From the above provisions, it is visible that India does indeed have the necessary groundwork for the labelling of chemicals, even though it was fundamental and therefore, vague. Need for advancements in law and improvements thereof were essential to be brought in further as the world developed and usage of chemicals became complex and advanced.

Hazardous Substances (Classification, Packaging & Labelling) Rules, 2011: These Rules are fully in alignment with the UN GHS requirements. The new 16-section SDS requirements can be beneficial in preparing the SDSs for the Indian markets.³³ The salient features of the Rules include:

- These Rules are an attempt to incorporate the provisions of both the UN GHS and TDG regulations.
- Being one of the prominent importers/exporters, it was pertinent that the Indian legislative bodies ensure that the new UN GHS Rules are complied with and are followed in India. However, these Rules have not been obtained by law and are sources of grave concern for the world and the Indian market.
- As per Rule 8, no occupier³⁴ shall handle material for transport or otherwise, which is a hazardous substance and has not been marked appropriately as per the requirements of these Rules.³⁵ The marking should be placed on the outer packing that is visible to the handler before he opens the package.³⁶

³³ Hazardous Substances (Classification, Packaging & Labelling) Rules, 2011.

³⁴ *Id.* Rule 3(n) ("Occupier means a person who has control over the affairs of the factory or premises and includes the person in possession of the substance").

³⁵ *Id.* Rule 8.

³⁶ *Id.* Rule 8 (2).

- Rule 8 (3) provides that a label must contain the following information:
 - i. Product Name (Chemical Name and the Chemical Abstract number);
 - ii. Weight;
 - iii. Name and address of manufacturer, supplier, importer, or any other necessary party;
 - iv. Emergency contact number (operational 24 hours in Hindi & English).
- In case the substance is considered to be hazardous, then the following information is required³⁷:
 - i. Proper Shipping name;
 - ii. UN Number;
 - iii. Hazard Class;
 - iv. Secondary Hazard; and
 - v. Packing group.
- A diamond placard of 100 mm x 100 mm is required, denoting the primary transport hazard class and in case of a secondary hazard, it shall be placed below it. Additionally, a diamond placard of 250 mm x 250 mm shall be placed if the substance is hazardous for supply and transport. The placards should be of such quality and style that they can survive the rigors of the journey.³⁸
- If two or more hazardous substances have been packed together, then each of them must have a separate placard on the outer packing, distinctly denoting each of them.³⁹
- The Rules incorporate the provisions of the GHS and TDG on a wide-scale. However, the pertinent issue still exists in the form that the Rule in it undermines the need for a much more detailed and robust regulation for the Labelling of Chemicals. Further, these Rules are still in a draft stage and have not yet been enforced, which is a cause for great concern.

Ozone Depleting Substance (Management & Control) Rules, 2000: These rules were published under the notification of the Government of India in the Ministry

³⁷ Id. Rule 8 (3)(e).

³⁸ Id. Rule 8 (3)(g).

³⁹ *Id.* Rule 8 (4)(x).

of Environment and Forests number S.O. 69(E), dated, 25th January 2000.⁴⁰ The growing concerns with the adverse impact that unregulated development was having on the environment and specifically the ozone layer had given rise to a plethora of debates and necessitated the adoption of certain regulatory norms to curb this adverse impact.

- Rule 8⁴¹ strictly disallows the usage of any substance laid out in Schedule I and mandates that there should be a specific label on those products indicating that there is no presence of any ozone depleting substance.
- Understandably, the Rules do not deal with chemicals specifically but this becomes an important rule in terms of chemical management. A brief perusal of Schedule I indicates that there are possibilities of overlap with chemical substances, therefore, the labelling is required in addition to the existing norms with regards to it.
- Rule 10⁴² with regards to import, export or sale states that the same shall not be allowed unless there is a label clearly indicating that the ozone depleting substances are not present in it. Therefore, making it the duty of importers, exports and suppliers to ensure that they follow the requirements and indicate accordingly.
- Overall, the Rule is not sufficient regarding the stout labelling requirements as there is no mention regarding the details of the label, the language, the size and other various indicators.

Chemicals (Management & Safety) Rules [4th Draft]: The fourth Draft of the Chemical (Management & Safety) Rules was released to select groups on 16 March, 2020. The Draft Rules lay down the guidelines for labelling of priority substances, amongst other things. As per the Rules, the following are considered as priority substances⁴³:

- i. Any Substance which falls under any of the following two categories of 7th edition of UN GHS of classification and Labelling of Chemicals (GHS Rev. 8):
 - a. Carcinogenicity and/or Germ-Cell Mutagenicity and/or Reproductive Toxicity and categorised as Category 1 or 2, or

⁴⁰ Ozone Depleting Substance (Management & Control) Rules, 2000.

⁴¹ *Id.* Rule 8 (Regulation on the use of ozone depleting substance).

⁴² *Id.* Rule 10 (Regulation of import, export and sale of products made with or containing ozone depleting substances).

⁴³ Chemicals (Management & Safety) Rules, [4th Draft], Rule 2 (cc), http://files.chemicalwatch. com/191213_Draft_Chemical_Safety_Rules_Final_%281%29.pdf (last visited May 25, 2020).

- b. Specific Target Organ Toxicity (Repeated Exposure or Single Exposure) Category 1 or 2;
- ii. Any Substance which fulfils the criteria of Persistent, Bio-accumulative and Toxic or very Persistent or very Bio-accumulative, as set out in Schedule II of these Rules; or
- iii. Any other Substances, as may be notified by the Division⁴⁴ from time to time.
- The Rules mandate the manufacturer, importer or downstream user (as the case may be) to ensure that all Priority Substances that are placed by them in the territory of India are bearing labels as per Schedule XI.⁴⁵ Further, they have to ensure that the product identifiers, hazard statements and pictograms, signal words, and precautionary statements used in the labelling of Priority Substances are in accordance with the GHS Rev. 8.⁴⁶
- The Rules make it the duty of the Manufacturer, Importer or Downstream User to ensure that the information contained on the label is correct,⁴⁷ it is placed on a visible position on the packaging,⁴⁸ marked clearly,⁴⁹ containing the information under schedule IX and the label should be in Hindi or English.
- Schedule IX lays out that the following is required for a label to be deemed appropriate⁵⁰:
 - i. The name, address, and telephone number of the manufacturer, importer or downstream user;
 - ii. The nominal quantity of the Priority Substance in the package made available to the general public, unless this quantity is specified elsewhere on the package;
 - iii. Product identifiers;
 - iv. Hazard pictograms where applicable;
 - v. Signal words, where applicable;

- 48 *Id.* Rule 28 (4).
- 49 *Id.* Rule 28 (5).
- 50 *Id.* Sch. IX.

⁴⁴ Id. Rule 2(1)(e) (Division means the Chemicals Regulatory Division).

⁴⁵ *Id.* Rule 28 (1).

⁴⁶ Id. Rule 28 (2).

⁴⁷ Id. Rule 28 (3).

- vi. Hazard statements, where applicable;
- vii. Appropriate precautionary statements, where applicable; and
- viii. IN Number as assigned by the Division.
- As can be seen from the requisite, information that should be on a label of a priority substance and the other aspects show that India seems to be moving to a stance of adopting the new GHS Rev. 8 Rules. The Rules do cover an array of other substances and the required labelling for them.
- However, the important aspect shall be to see when these rules are enforced. Furthermore, the adoption of these above rules does not oust the need for a more robust regulation regarding labelling as this does not entirely cover the specifications and indications of a label. The mere reference to GHS is not sufficient and there is a need for specific adoption to avoid ambiguity.

ANALYSIS OF THE EXISTING RULES IN INDIA

India needs a comprehensive chemical regulation strategy and several steps have been taken by the country in this regard. The approach signified by the new draft rules aligns with the approach adopted by other countries. The use of standard procedures for notification, registration and evaluation measure is a fair example of this.

India has borrowed elements from recognized chemical governance frameworks such as REACH in the EU and K-REACH in Korea. In doing so, India is developing a chemical governance machinery that is familiar to global chemical stakeholders. However, there are some unique elements also that are expected to generate a bit of confusion and discord among manufacturers, importers, and downstream users.⁵¹ But, the notification system adopted by India will provide an opportunity to the impacted companies to consider the introduction of chemicals in India strategically and mindfully, as there are fees and distinctive data elements that need to be adhered to. However, it is high time that India drafts and implements its own legislation, one that can expansively deal with the multitude of issues that arise when dealing with the labels of chemicals and ensure that India and its businesses are compliant with the TDG and GHS norms.

⁵¹ *India Announces Fourth Draft Chemicals (Management and Safety) Rules*, NATIONAL LAW REVIEW, https://www.natlawreview.com/article/india-announces-fourth-draft-chemicals-management-and-safety-rules (last visited Mar. 27, 2020).

The Environment (Protection) Act, 1986 serves as an umbrella legislation to link regulations without interfering with the autonomy of other rules. Various ministries and regulatory agencies at the national and state level are responsible for implementing the laws. However, there is no singular ministry or agency that looks into chemicals specifically, nor is there any collection of data or research being specifically done by them for looking into the effects of chemicals on the environment and the people.

Only the Manufacture, Storage and Import of Hazardous Chemical Rules and the Ozone Depleting Substances Rules are enacted as a law. This is a clear indication that with regards to the labelling requirements, which is a crucial aspect world over, it has not been given the requisite importance that it should have received in terms of detailing. The above two rules set out an insufficient groundwork for labelling as there is a need for more and it is important to see if the 2011 Draft Rules receive the force of law.

There are pertinent gaps in the existing rules. Since the rules were drafted decades ago, there is a need for a much more pragmatic set of rules and a more proactive approach to ensure that development of the chemical sector happens and ample provisions and measures should be put into place to ensure the safety and health of the environment as well as of the people at large. It is a primal concept that economic growth should not be hindered but it cannot be achieved at the expense of the environment or humans.

CHANGES REQUIRED

The Chemical Industry in India is very diversified, having a vast coverage and plays a very important role in the country's industrial and economic development. It includes not only basic chemicals and their intermediates but also fertilizers, pesticides, petrochemicals, paints and dyes, bulk drugs, and pharmaceuticals. However, considering the potential hazard risks that the chemical sector inherently possesses, it is important to put checks and balances in place to safeguard the larger public interest.

With rising consumer awareness and active initiatives by non-governmental organisations, the pressure on the government has increased for the formulation of policies that can place adequate checks and balances on the chemical sector to ensure adequate safeguards to protect the general public from the potential risks of chemical hazards. Considering this, it would be expedient to bring chemical management under a single nodal agency. This would ensure proper administration of the Indian

Chemical Policy by providing the necessary technical and scientific support. This would centralise the receipt and dissemination of information regarding the intrinsic properties of various hazardous chemicals. Further, it will also help in maintaining a comprehensive centralised database of all notified chemicals.

The establishment of a single centralised nodal agency will also help state governments in their efforts in effective enforcement of chemical policy. In the age of the knowledge economy, this agency can make non-confidential information accessible to the general public, and create an efficient and secure data exchange network for commercially sensitive information with the state governments.

The enactment of comprehensive legislation regulating chemical labelling and usage should also be considered. It can incorporate existing regulations with the objective of gradually merging all existing regulations and administrative agencies dealing with chemicals under a single umbrella policy. However, before the establishment of such a policy and single nodal agency, a feasibility study should be conducted to identify the pros and cons of the proposed regulatory framework.

With regards to companies that are dealing with chemicals, it is necessary for them to be pro-active in terms of regulating the use of these hazardous chemicals, look into aspects and advents that ensure that minimal harm is brought forth to the environment and/or the people. Despite the absence of a strict agency and a robust regulatory regime, the companies can easily comply with the norms of the UN. Many of the exporters do already comply with the international labelling requirements as and when they export to particular locations. A sense of corporate responsibility already subsists, with many industry leaders taking steps of their own accord to establish and follow an appropriate set of regulations for the benefit and welfare of the people and the environment. However, this does not preclude the need for better governance by the agencies and better regulation to ensure appropriate safeguards. Transport is widespread now, and to increase welfare, the industry player and agencies have to be proactive.

CONCLUSION

It is abundantly clear that the regulatory regime in India with regards to labelling standards for chemicals is still very nascent. There is need for a single agency and one unified law that can deal with labelling requirements of chemicals. However, any legislation that is intended to achieve this objective has to consider that the
entire chemical industrial setup (including the supply chains, both upstream and downstream) has to undertake considerable adjustments in the designing, processing of their products to comply with the law. A phased approach can be considered. Hence, a phased and gradual approach will be suitable.

Regarding the issue, the first step could be having a specific mandate towards "very hazardous" chemicals. It is necessary to identify these extremely hazardous chemicals and pass notifications that all manufacturers, suppliers, exporters and importers dealing with these chemicals listed must register with a specific body. The body would take note of the existing quantities, the permissible consumption levels and the people that are dealing with these chemicals. Keeping records is of utmost importance. After that, once there is smooth and complete implementation for "very hazardous" chemicals, they could shift the regime to adopt "hazardous" chemicals and thereafter, adopt it for all chemicals, as required under the GHS. This is a proposed way of moving ahead, given the stagnation and long delay in enacting a robust regulation with regards to labelling. The two pertinent issues that have prominently arisen when dealing with the issue are: first, there is no specific Agency and second, there is no specific law. It will be essential to wait and see whether the 4th draft will be accepted and made into law and also, if the 2011 Draft Rules shall ever be enforced. Given the current scenario with the world grappling with the hardships of the COVID-19 pandemic, further delays can be expected in the enactment of a more concise and definite regime. Nonetheless, it is arguable that with India's growth, the unnecessary burden on the environment and the aftermath of the pandemic all mandate the enforcing of the Rules.

Chapter 4 Extended Producer Responsibility

INTRODUCTION

In 1990,¹ Thomas Lindhqvist coined the term 'Extended Producer Responsibility' (EPR). The definition of EPR was first given by the Swedish Ministry of Environment and Natural Resources: "*Extended Producer Responsibility is an environmental protection strategy to reach an environmental objective of a decreased total environmental impact from a product, by making the manufacturer of the product responsible for the entire life-cycle of the product and especially for the takeback, recycling and final disposal of the product.*²² The Organisation for Economic Cooperation and Development (OECD) has defined EPR as "*an environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of a product's life cycle*".

The principle of EPR emerged through the analysis of experiences from recycling and waste management systems, and the implementation of policy instruments to promote cleaner production. It was in the early 1990s that the principle of EPR as a product policy was introduced. This was to address the life-cycle issues of products by introducing a target-oriented approach. EPR was tested as an alternative to the use of the conventional command-and-control method of regulation. The Command-and-Control method of regulation involves identification of the type of activity that may be harmful, which is followed by regulation on such activity and eventual prohibition.

The EPR policy is characterized by the provision of incentives for producers to take into account the environmental impact of their products while designing the same. As per the OECD, "while other policy instruments tend to target a single point in the chain, EPR seeks to integrate signals related to the environmental characteristics of products and production processes throughout the product chain". The EPR regime has now introduced a paradigm shift when compared to the traditional solid

¹ Development of Guidance on Extended Producer Responsibility (EPR), EUROPEAN COMMISSION, https://ec.europa.eu/environment/archives/waste/eu_guidance/introduction.html_(last visited June 01, 2020).

² Thomas Lindhqvist, Extended Producer Responsibility in Cleaner Production 37 (2000) (Ph.D. dissertation, Lund University).

waste management approach. Under the EPR, there is a shift in the responsibility to handle wastes from Government (primarily local self-governments) to entities manufacturing the products concerned. This involves the implementation of the Polluter Pays Principle (PPP), with a change in the definition of the 'polluter' such that the term denotes the economic agent who can take decisive actions in avoiding pollution by making eco-friendly designs.

There is also an economic backing to the EPR concept wherein the producers can internalize disposal and treatment costs which offer an incentive to design products that last longer and are easy to be treated after their shelf life has ended. To understand it better, the cost on the environment for recycling waste cannot match the postconsumption cost. It justifies the imposition of the targets for recycling. The model of transferring costs on the consumers often reduces scope for making designs which are eco-friendly. Producer Responsibility Organisations (PROs) often exert this responsibility so that benefits gained from producers who improve their products are distributed to all producers who belong to the same PRO.

The imposition of responsibility on individual producers to take back the sold goods is rare and has several limitations due to limited number of users. Individual systems of take-back would result in complications due to different approaches being taken by different companies. Therefore, collective compliance schemes, which benefit a greater number of people, are more common than individual schemes. In collective schemes, specific organisations, i.e., PROs are set up to implement the EPR principle in the name of all the obligated companies. There are three main functions as performed by PROs, which can be executed in different ways:³

- financing the collection and treatment of the targeted solid waste;
- organising and supervising these activities;
- managing the corresponding data.

Thomas Lindhqvist, the developer of the EPR principle, analysed the results of a study conducted on the emission level of chromium from a product. He found that the emissions from manufacturing were negligible as compared to those generated

³ DG ENVIRONMENT, EUROPEAN COMMISSION, DEVELOPMENT OF GUIDANCE ON EXTENDED PRODUCER RESPONSIBILITY (EPR): FINAL REPORT (2014), https://ec.europa.eu/environment/archives/waste/eu_guidance/pdf/ Guidance%200n%20EPR%20-%20Final%20Report.pdf

during the usage and end-of-life phases.⁴ This is what led to the development of the concept of Extended Producer Responsibility, which encourages the development of environmentally benign products and product systems.

The concept extends the responsibility of the producer to the entire life cycle of the product chain-*from cradle to grave*. Thus, it entails two broad policy objectives –

- i. design improvements in products and product systems; and
- ii. high utilisation of product and material quality through effective collection, treatment, re-use or recycling [in an environmentally friendly and socially desirable manner]".⁵

The former objective represents the *upstream/design objective* which encourages the producer to design products so as to reduce the consumption of virgin material, to reduce waste generation and to ensure that the materials utilized are within the utility cycle, in order to promote resource efficiency and sustainable development. Since the main objective of EPR is to stimulate product system improvements,⁶ methods such as 'Design for Environment (DfE) or Design for Disassembly (DfD)' are employed for improvement in the design process of devices from an environmental perspective. The latter objective represents the *waste management/downstream objective*, which covers the collection, treatment, and reuse and recycling of the product after the end of its life. The responsibility of the producer at this stage, through take-back schemes, is the focus of EPR and a distinguishing factor from other "conventional" e-waste management policies. Under the take-back scheme, the producers are responsible for setting up collection centres or take-back systems either individually or collectively.

For achieving the two objectives mentioned above, liability is imposed upon the producer. Each provision for liability may embrace different parts of the life cycle of the product, including usage and final disposal.⁷ Sweden was the first country to successfully implement this model and imposed the following types of responsibilities-

• *Economic responsibility* means and includes the coverage of all or part of the waste-related expenses by the producer, which is inclusive of the collection, recycling and final disposal of the products manufactured. These expenses could

⁴ Lindhqvist, *supra* note 2.

⁵ Chris Van Rossem et al., EPR: An Examination of its Impact on Innovation and Greening Products 5 (2006).

⁶ Lindhqvist, *supra* note *2*.

⁷ Id.

be paid for directly by the producer, or through the imposition of a special fee on producers.

- *Physical responsibility* is characterized by the use of systems where manufacturers are involved in the physical handling and management of products and/or their effects. It is up to the manufacturers to retain the ownership of the products manufactured by them throughout their life cycle and accordingly be responsible for the environmental impacts of the product.
- *Informative responsibility* signifies several different possibilities to extend responsibility for the products by requiring the producers to supply information on the environmental properties of the manufactured products.⁸

The aforesaid classification has helped the Swedish government to frame a policy on Extended Producer Responsibility. It has successfully illustrated the need for specifying the responsibility for waste management, both in terms of the persons responsible and their specific responsibilities.

The broader concept of Extended Producer Responsibility encompasses some major policy instruments that aid in the implementation of the concept. The following are some of the most widely-used EPR related instruments –

- *Product take-back mandate and recycling rate targets* Under this instrument, the Government mandates the manufacturers and/or retailers to take back products at the end of their life cycles. This instrument has to be combined with mandates to recycle the waste and to divert the same from landfills.
- *Product take-back mandate and recycling rate targets, with a tradable recycling credit scheme* This instrument mandates the above-mentioned responsibility for the industry as the whole, and not for each individual producer. Tradable credits are issued and firms are allowed to trade among themselves. An industry-wide recycling rate target can thus, be met even when some producers may perform better than others.
- *Voluntary product take-back with recycling rate targets* Under this instrument, the implementation of take-back systems and recycling goals is purely voluntary for the industry to undertake, with no penalties or government enforcement.



- Advance Recycling Fees (ARF)- Advance Disposal Fee is the original terminology for ARF. The Disposal Fee was originally a tax levied on product sales, often to cover the cost of recycling. The assessment of ARFs is often done per unit of the product sold, but can also be undertaken based on the weight of the sold product. The imposition of ARF on consumers is reflected in the cost of the product. It could be imposed as a separate tax or charge in the bill, similar to GST-or it could be imposed on producers and later be incorporated into the product retail price.
- *Recycling subsidies and Advance Recycling Fee* The collection and utilization of money raised from ARF can be used in variety of ways. A "back-end" recycling subsidy, either per unit or per pound of material recycled leads to this instrument being different from the ARF, where the revenue collected is used to cover the waste management/ infrastructure creation costs.

These policy instruments make the producers physically or financially responsible for the end-of-life environmental impacts of their products. Each of the schemes have their own forms of incentive and have different impacts on the environment. These are in addition to the prescriptions that are enforced on the producing companies that are responsible for the wastes generated.

PRODUCER OBLIGATION

The idea of making the producer responsible for the product manufactured by him under the principles of EPR has been adopted and implemented across the world. However, the determination of the best model for the implementation of such responsibilities is a contentious issue. A section of the industry believes that voluntary initiatives deliver similar ecological benefits as legally mandated measures.⁹ These, further, have a greater advantage from the cost perspective, and the flexibility that is afforded by voluntary implementation may also lead to a varied approach to sustainability. Even some governments have preferred a voluntary system as the political will to put forth environmental concerns before businesses and employers is lacking. Some of the entities that are implementing the schemes voluntarily have greater advantage over those failing to do so. The voluntary implementation of these schemes allows selected representatives and policy-makers to engage in a debate

⁹ Neil Gunningham and Darren Sinclair, *Voluntary Approached to Environmental Protection: Lessons from Mining and Forestry sectors*, (Conference Paper, Conference on Foreign Direct Investment and the Environment, 7-8 February, 2002) https://www.oecd.org/env/1819792.pdf.

about the EPR scheme.¹⁰ The implementation of voluntary programs of taking-back has become possible due to the presence of following characteristics –

- a. Improper disposal and associated liabilities, which maybe classified under the high-risk category;
- b. The value of the discarded product is high;
- c. Relationship of the manufacturer and consumer based on the frequency, value, and the type of product.

These characteristics are interlinked as improper disposal has associated liabilities which could be classified under the high-risk category. Further, the value of discarded products is high as the utilization of raw materials that are virgin resources are estimated to be of high value and also capable of being recycled. Furthermore, the success of the voluntary take-back programs has become possible due to the relationship between the manufacturer and consumer based on the product type that has been used.

Critics of this view, point out that the voluntary programs usually lack credibility, and are away from the eyes of regulators. This may raise questions about the implementation of the scheme itself as some of the voluntary initiatives are poorly managed, opaque in terms of reporting, use unclear terms in enforcing the targets and fail to obtain third party reviews of the system adopted.¹¹ Even though there are various programs under which voluntary schemes may be floated, many schemes face such issues. Voluntary schemes are beneficial in terms of increasing corporate responsibility towards the environment, building public image, avoiding the government scanner (in some cases) and increasing the market share of the companies concerned. However, the ultimate impact on the environment needs to be ascertained and examined.

Ultimately, the responsibility of the producer has to be ascertained for the successful implementation of EPR. The following sub-sections will discuss some important specifications that need to be provided in any EPR policy.

¹⁰ Organisation for Economic Co-operation and Development, Voluntary approach for environmental policy: Effectiveness, efficiency and usage in policy mixes (2003).

¹¹ Robert Gibson & Jennifer Lynes, Voluntary Corporate Initiatives for Environmental Improvement, 24(2) ALTERNATIVES 18 (1998).

Collective producer responsibility v. Individual producer responsibility

One of the key elements of an EPR policy is to determine whether responsibility should be assigned individually or collectively. Both Individual Producer Responsibility (IPR) and Collective Producer Responsibility (CPR) vary in several respects. While IPR makes the producers responsible for their own products, producers in CPR are responsible for the similar product type or category for end-of-life management. It is recommended that IPR should be adopted since a producer will be more inclined to improve designs when they can reap the benefits of the improvements.¹²

Take-back system

If a take-back system is implemented, the overall control and responsibility for the successful operation of the system must be vested with an entity. This entity will coordinate actions among stakeholders, enforce the system's rules, and ensure compliance. Two types of entities are to be considered herein¹³:

- Government Agencies Once a take-back system is established, government agencies may be tasked with maintaining the system. Agencies that handle environmental affairs are often assigned the supervision of system operations. The government can play a vital role in enforcing the take-back system.
- Third Party Organisations (TPOs) Their members may include manufacturers, producers, recyclers, collectors or even government entities. They are tasked with the management and administration of the take-back system, often in coordination with the national government.

Deciding the mode of collection

The mechanism for collecting and transporting e-waste to reuse and recycling facilities/locations has to be determined. Depending on the stakeholders responsible for collection, the modes of collection could be different. There are three types of collection methods¹⁴ –

¹² NAOKO TOJO, EPR PROGRAMMES: INDIVIDUAL VERSUS COLLECTIVE RESPONSIBILITY – EXPLORING VARIOUS FORMS OF IMPLEMENTATION AND THEIR IMPLICATION TO DESIGN CHANGE (IIIEE Reports 2003), https://cdn.ymaws.com/www.productstewardship.us/resource/resmgr/imported/EPRIndivvscollective03.pdf.

¹³ SOLVING THE E-WASTE PROBLEM, E-WASTE TAKE-BACK SYSTEM DESIGN AND POLICY APPROACHES (White Paper, 2009), https://www.step-initiative.org/files/_documents/whitepapers/StEP_TF1_WPTakeBackSystems.pdf.

¹⁴ *Id*.

- a. *Permanent drop-off facilities* offer locations for waste producers to dropoff e-waste year-round. These locations are usually under the domain of Municipalities and other Government agencies, and are commonly co-located with other hazardous waste drop-off sites. Policymakers can also encourage separate collection by establishing realistic and achievable collection targets. The best target for a given region or country will depend on various factors including the availability of information, the handling capacity of the system, the socio-economic setting and complexity involved and the availability of recycling infrastructures. A retailer could also operate a drop-off facility within its retail outlets. Any drop-off facility must be capable of storing and transferring e-waste as recyclers do not collect e-waste on a day-to-day basis.
- b. *Special drop-off events* are those which are usually limited to one or two-days, enabling the dropping off of e-waste at the designated locations. The most important component of this type of event is publicity. Publicity increases the collection amounts while educating the public on e-waste recycling options.
- c. *Door-to-door pick-up* is dependent on the stakeholders. Government entities can initiate curb-side pickup services for white or brown goods. Commercial entities are often more incentivized to collect e-waste from other commercial clients that generate large volumes of e-waste.

Monitoring the implementation of the strategy and plan

In tracking progress and ensuring the transparency and credibility of any strategy, plan or measure, the person responsible for tracking progress and the verification mechanisms to be employed must be specified. Possible monitoring approaches include: -

- a. Self-monitoring with regular reporting;
- b. Government monitoring and reporting;
- c. Third-party monitoring through an accreditation or certification scheme;
- d. A combination of the above mentioned approaches.

For successful implementation and to ensure that the EPR framework is well managed, the Organisation for Economic Cooperation and Development (OECD) had issued a manual in 2001 which is still relevant and applicable for the systems struggling to implement the EPR policy. The Manual focuses on incentivizing the producers to

change the designs of the products, which can stimulate innovations, leading to the adaptation of the life-cycle of the products and thereby defining responsibilities. This is one of the guiding documents on EPR which has led to the defining of responsibilities and the framing of flexible policy instruments to a particular product type and waste streams. The 2001 Guidance Manual also provides for specific recommendations on a variety of issues. Some of its key elements have been integrated with the experience from industry, which are as follows¹⁵ -

- i. Governance and design of EPR Performance is crucial for which governance and design play a major role. Issues under this range from the setting of targets to monitoring enforcement, and financing.
- ii. Policy of promoting competition and EPR Waste management and recycling industries have grown manifold in the past few decades, thereby becoming more concentrated. This has led to a form of anti-competitive behaviour which requires new checks and balances.
- iii. Design for environment incentive Strict enforcement and adaptation of some designs for end-of-life costs will strengthen incentives for improving the eco-design of products and packaging.
- iv. Informal workers' integration in developing countries Many countries have implemented the EPR Scheme which involves the deployment of large number of workers in the informal sector in recycling. Greater threat to human health and life is evident, which raises serious concerns about the informal sector of recycling and dismantling thereby impacting the environment and economy at large.

There are greater benefits and incentives for the implementation of EPR schemes for the developing economies, as they provide such economies with an opportunity to recycle and reuse the waste that is generated. Hence, decreasing dependence on virgin resources for supplying the manufactured products to their citizens.

¹⁵ OECD, EXTENDED PRODUCER RESPONSIBILITY: UPDATED GUIDANCE FOR EFFICIENT WASTE MANAGEMENT (2016).

EPR and International Law

The Basel Convention,¹⁶ Rotterdam Convention¹⁷ and Stockholm Convention¹⁸ have common objectives, i.e., to take necessary steps for the protection of environment and human health. The primary focus of these Conventions is hazardous chemicals and wastes at all stages of their life cycle, from production to disposal. The Rotterdam and Stockholm Conventions cover the control of the international trade of chemicals, while waste trade is primarily regulated under the Basel Convention. In all three Conventions, a slew of measures has been provided in order to reach the desired objective. They also lay down the conditions and procedures for import and export of the chemicals and wastes covered. In order to protect countries from receiving unnecessary imports, the conditions and procedures incorporated herein will pave the way for States to formulate their domestic laws. While prevention and combat of illegal traffic of hazardous waste has been addressed under the Basel Convention, efforts are now being made to consider the issue under the Rotterdam and Stockholm Conventions as well.

BASEL CONVENTION

The scope and application of the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal covers a wide array of wastes defined as 'hazardous wastes' based on their origin or composition. Some of the key principles of this Convention are -

- a. The reduction of hazardous waste generation and the promotion of environmentally sound management of hazardous wastes, wherever the place of disposal be;
- b. The restriction of transboundary movement of hazardous wastes except where it is perceived to be in accordance with the principles of environmentally sound management; and
- c. A regulatory system applying to cases where trans-boundary movements are permissible.

¹⁸ Stockholm Convention on Persistent Organic Pollutants appendix II, May 23, 2001, 2256 U.N.T.S. 119.



¹⁶ Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126.

¹⁷ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Sept. 10, 1998, 38 ILM (1999).

"Environmentally sound management of hazardous wastes or other wastes" means taking all practicable steps to ensure that hazardous wastes or other wastes are managed in a manner that will protect human health and the environment against potential adverse effects. Environmentally sound disposal, on the other hand, covers all the operations mentioned under Annexure IV of Basel Convention, such as recycling to reclaiming back, and reuse to recovery/regeneration.

The Convention provides for the establishment of regional or sub-regional centres for training and technology transfers regarding the management of hazardous wastes and other wastes, and the minimization of their generation to cater to the specific needs of different regions and sub-regions.¹⁹ There are two major amendments that have been made to the Basel Convention after its adoption - one is the 'Basel Ban', which prohibits the movement of any hazardous waste to be exported by developed countries to the developing countries. The other amendment is the Basel Protocol on Liability and Compensation for damage resulting from trans-boundary movements of hazardous waste, also referred to as the "Liability Protocol". As per the Liability Protocol, if any country suffers damage to health, environment etc., from the import of hazardous waste in their territory without proper procedures as prescribed under the Basel Convention, such receiving country is entitled to compensation from the exporting country. In 2018, the Open-ended Working Group,²⁰ in its 11th meeting, introduced a manual aimed at all groups of stakeholders, especially governmental authorities working on national policies and regulations on EPR with specific focus on the legal, governance and enforcement matters which also involved the international cooperation and coordination, scientific and technical matters. One of several needs for creating Environmentally Sound Management (ESM) instruments is sufficient financing. Investments in infrastructure and costs relating to the operation and maintenance of facilities require a sustainable flow of financing.

ROTTERDAM CONVENTION

The Rotterdam Convention on Prior Informed Consent is a means for formally obtaining and disseminating information to enable decisions by importing countries as to whether they wish to receive future shipments of certain chemicals, and for

¹⁹ *Id.* art 14.

²⁰ Eleventh Meeting of the Open-ended Working Group of the Basel Convention (OEWG.11), BASEL CONVENTION, http://www.basel.int/TheConvention/OpenendedWorkingGroup(OEWG)/Meetings/OEW G11/Overview/tabid/6258/Default.aspx#:~:text=At%20its%20eleventh%20meeting%2C%20by,of%20 hazardous%20and%20other%20wastes (last visited June 01, 2020).

ensuring compliance with these decisions by exporting countries.²¹ Article 14 expressly provides for the said information exchange. This information exchange provision is coherent with informative responsibility²² under EPR. The Convention promotes the exchange of information on a very broad range of hazardous chemicals, including those not included in Annex III yet. It calls on the exporters of those hazardous chemicals to make use of proper labelling, include directions on safe handling, and to inform importers of any known restrictions or bans, the expiry date of the chemical, precautionary measures including hazard classification, the nature of the risk and the relevant safety advice, and the summary results of the toxicological and eco-toxicological tests. The production date of the chemical shall generally not be considered confidential for the purposes of this Convention.

1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, 1972 – London Protocol²³

A significant milestone for the protection of the marine environment was reached on 24th March, 2006 with the entry into force of the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972.²⁴ Compared to the 1972 Convention, the 1996 Protocol reflects a more modern and comprehensive agreement on protecting the marine environment from dumping activities. It further reflects broader aims to protect the environment in general, emanating from Agenda 21, the global plan of action for sustainable development adopted by the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil.

The 1996 Protocol introduces the 'precautionary approach'²⁵ as a general obligation. This requires that "appropriate preventative measures are taken when there is reason to believe that wastes or other matter introduced into the marine environment are likely to cause harm even when there is no conclusive evidence to prove a causal relation between inputs and their effects."Article 3(2) also states that "the polluter

²¹ *How it Works*, ROTTERDAM CONVENTION, http://www.pic.int/TheConvention/Overview/Howitworks/tabid/1046/language/en-US/Default.aspx (last visited June 01, 2020).

²² David Haskell, *What is Extended Product Responsibility*, GRRN (Mar. 22, 2019), https://archive.grrn. org/resources/what_is_epr.html (The term Informative Responsibility refers to responsibility of the producer for providing information on the product or its effects at various stages of its life cycle).

²³ Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, Dec. 29, 1972, 1046 U.N.T.S. 120.

²⁴ Id.

²⁵ Id. art. 3.

should, in principle, bear the cost of pollution" and it emphasizes that Contracting Parties should ensure that the Protocol should not simply result in pollution being transferred from one part of the environment to another.

In any Convention, for further steps to be taken, it should be made mandatory for either party to *first* take the responsibility of the product after its life. *Second*, there should be disclosure of all the information regarding the proper use and expiry date of the product, and any information which would directly impact the life period of the same (this would enhance the upstream objective of EPR). *Third*, the lack of governmental incentive for the producers to meet the EPR collection targets may be a reason for their lax attitude. In China, the 'Old for New' scheme makes formal collection system more attractive in two ways: first, by giving subsidies to retailers and other formal take-back entities to offer incentives to consumer to drop their e-waste to the formal sector; second, giving high subsidies to the formal sector in order to compete with informal collection system. Thus, providing lucrative incentives to the producers can be a way to increase the participation of the producers, as the EPR already puts extraordinary pressure upon the producers to reallocate their finances towards recycling rather than new product development. *Lastly*, public awareness (by the exporting party) is a prerequisite to create a successful model of EPR.

Legal Framework for EPR in India

The legal framework for Extended Producer Responsibility in India was brought out recently by the Ministry of Environment, Forest and Climate Change (MoEF&CC).²⁶ It was under the Plastic Waste Management Rules, 2016 that the concept of EPR was introduced. As already discussed, the idea of EPR is to impose the responsibility on the polluter, and to make such polluter pay in order to tackle the issue of waste management. Even though it is a small effort towards taking back and recycling the waste generated, there have been a few companies which have submitted their EPR plans to the Central Pollution Control Board (CPCB).²⁷ The Guidance Document on *Uniform Framework for Extended Producers Responsibility (Under Plastic Waste Management) Rules, 2016* released by the Ministry of Environment Forests and Climate Change mandates the waste generators to take necessary steps

²⁶ MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE, GUIDANCE DOCUMENT – UNIFORM FRAMEWORK FOR EXTENDED PRODUCERS RESPONSIBILITY (2020), http://moef.gov.in/wp-content/uploads/2020/06/Final-Uniform-Framework-on-EPR-June2020-for-comments.pdf.

²⁷ Priyanka Pulla, *Making India's Polluters Pay*, THE HINDU (Dec. 15, 2018), https://www.thehindu.com/ sci-tech/energy-and-environment/making-indias-polluters-pay/article25753356.ece.

to minimize plastic waste generation, and to ensure that the waste is not littered, segregation is conducted at source and the waste segregated is handed over to the authorities concerned at the local level (mostly the Municipalities). India generates massive volumes of waste to the tune of 25,000 to 30,000 tonnes every day and an approximate 10,556 tonnes of waste remains uncollected, which either reaches landfills or is littered.²⁸

The present guidance document is broken into three parts which are suited to the small, medium and large businesses. The three models are -

- a. Fee based model The primary responsibility for collection, segregation and disposal of the plastic lies with the local authorities which will have the duty to support and effectively manage the wastes through Assemblers and rag pickers. EPR Corpus Fund which is created, shall have the contributions from producers/ importers/brand owners. This Corpus Fund will be provided to the local authorities and plastic recyclers.
- b. PRO Model–This model provides for creation of an organisation called the Producer Responsibility Organisation where the PRO will carry out the legal requirements on behalf of its member companies. The PROs involve and work closely with the local authorities to set up and maintain, collect, segregate, sort the systems.
- c. Credit Model–This model under EPR does not require the producers to recycle their own packaging but requires them to recover/recycle packaging waste in order to meet their obligation. This is more particularly related to Plastic Credit, wherein the producers and exporters exchange the plastic credits for financial transaction for a price and other terms that may be negotiated between the parties.

Another major contribution towards the waste comes from electronic waste. Electronic products have become an integral part our lives and are also one of the major contributors to the waste generated. Electronic waste is an issue for many developing countries that needs to be tackled. India formulated the Electronic Waste (Management) Rules in 2016. There were efforts prior to this: it was in 2005 that

²⁸ National Framework for India's Extended Producer Responsibility (EPR) is now prepared, PLASTICS FOR CHANGE (December 10, 2019), https://www.plasticsforchange.org/blog/category/national-framework-for-indias-extended-producers-responsibility-epr-has-been-announced.

an attempt was made to enforce the EPR Policy by way of introduction of private member's Bill.²⁹ There have been, however, laws that were introduced later on to address the issue of waste management and EPR Scheme in India.

Plastic Waste (Management) Rules, 2016 and Amendment of 2018

Issue of plastic waste disposal has been one of the major concerns in the recent decades. Due to its fundamental nature of being non-biodegradable, it is considered as one of the most environmentally non-benign products to be manufactured. Despite it being harmful and taking hundreds of years to degrade, plastic has multiple uses and commercially viable physical and chemical properties, and is hence, one of the leading products that are manufactured. The indiscriminate disposal of plastic waste has become a major issue to be tackled to protect the environment. Plastic carry bags, in particular, are one of the biggest contributors of littered waste. Millions of plastic bags are land filled or dumped in the seas that can lead to the micro-plastic buildup in the environment, in the soil, water bodies, water courses, etc. The major issue with plastic is that it takes hundreds, and in most cases, thousands of years to get degraded. Uncontrolled waste disposal with poor handling facilities has made it one of the most difficult products to be recycled. In order to address this issue and to introduce proper waste management mechanisms, the Plastic Waste (Management and Handling) Rules, 2011 were introduced. These were considered inadequate to deal with the issue of plastic waste management and to replace these, the Government introduced the Plastic Waste Management Rules, 2016 which were amended in the year 2018. The main objective of the Plastic Waste Management Rules, 2016 is to make the producers and generators responsible in the plastic waste management system, and to introduce the concept of take-back system whereby the plastic waste produced is to be taken back by the producers/brand owners, under the EPR regime.

It was for the first time in India that producers, which included the individual and bulk generators, were made responsible. Bulk generators include commercial spaces and establishments. Under these rules, industries are mandated to segregate the plastic waste at the source of generation. Subsequently, the segregated waste has to be handed over to the concerned authority, which might be the municipality or the local body, by making the payment of a user fee as mandated under the respective byelaws. In the earlier regime, EPR was left to the discretion of the Municipalities and Panchayats to be dealt with. But under the present regime, the producers have been

²⁹ The Electronic Waste (Handling and Disposal) Bill, 2005.

made responsible. Producers include persons engaged in manufacturing activity, importing carry bags, and undertaking multi-layered packaging, wrapping and other related activities. Furthermore, the brand owners are made responsible for collecting such wastes generated from manufactured products. They have to approach local bodies for the formulation of plans/systems for plastic waste management within the prescribed timeframe. Some states in India have also taken proactive steps to implement legislative measures to curb the use of plastic, and also to ensure that the EPR principles are incorporated. ³⁰

Even though the EPR regime was ushered in under the Plastic Waste Rules, some aspects of it have not yet been implemented in full throttle. For example, the deadline to phase out the multi-layer plastics (MLPs) was set to 2018. However, this could not be implemented due to the pressure from the industries and concerned stakeholders. Nevertheless, with industries' willingness and with proper implementation, the law can succeed in achieving its desired objective.

Maharashtra Plastic and Thermocol Products (Manufacture, Usage, Sale, Transport, Handling and Storage) Notification, 2018

The Environment Department, Government of Maharashtra introduced the Maharashtra Plastic and Thermocol Products (Manufacture, Usage, Sale, Transport, Handling and Storage) Notification, 2018 on the 23rd March, 2018.³¹ This Notification was issued under the Maharashtra Non-Biodegradable Garbage (Control) Act, 2006, and is applicable for the whole of Maharashtra. It aims to prohibit or impose a ban on the "manufacture, usage, transport, distribution, wholesale and retail sale and storage and import of plastic bags with and without handles and the disposable products manufactured from plastic for packaging which is mostly Multi-layered Plastic that includes paper, polymeric materials, metalized layers or aluminum foils. Furthermore, any product that is manufactured using a polystyrene material, including disposable items like plates and cups, any other daily use items used for food packaging in hotels, and any items used for the general packaging of food items and food grain materials, is covered under the ban. The use of plastic and thermocol for decoration purposes is banned.

³⁰ Environment Department, Maharashtra Plastic and Thermocol Products (Manufacture, Usage, Sale, Transport, Handling and Storage) Notification, 2018, C.R. No. 24/TC-4 (Notified on Mar. 23, 2018).

³¹ Id.

The other rules to be read along with this Notification are Maharashtra Plastic Carry Bags (Manufacture and Usage) Rules, 2006 which lay down a ban on the plastic bags of less than 50 microns.

Electronic Waste (Management) Rules, 2016

India has tremendous potential and market for electronic goods which also brings about the problem of the e-waste generated. Electronic devices made of plastic, silicon, fiber and other non-bio degradable materials form the major chunk of generated waste. In order to tackle this issue, the Central Government, in exercise of the powers conferred under the Sections 6, 8 and 25 of the Environment (Protection) Act, 1986, notified these Rules.

The Rules of 2016 replaced the erstwhile E-Waste (Management and Handling) Rules, 2011. The primary objective of the Rules is to enable the recovery and/or reuse of useful materials from e-waste. This will, in turn, contribute to the overall reduction of hazardous waste destined for disposal, and provide for an environmentally benign way for the management of different types of electronic waste. These Rules are applicable to every producer, consumer and bulk consumer, manufacturer, collection centers, dealers, e-retailer, refurbisher, dismantler and recycler involved in the manufacture, sale, purchase and processing of electrical and electronic equipment, including such equipment's components, consumables, parts and spares which make the product operational.³² It has also carved out some exceptions, which implies that the Rules are not applicable to -

- a) The Lead Acid Batteries, which are classified under the Batteries (Management and Handling) Rules, 2001;
- b) Some of the Micro enterprises which are within the ambit of Micro, Small and Medium Enterprises Development Act, 2006; and
- c) Radioactive wastes under Atomic Energy Act, 1962.

At present, the Rules define the responsibilities that are imposed on actors involved in different parts of the supply chain of these products. There are different roles and responsibility assigned to the manufacturers, producers, centers which collect wastes, dealers, refurbishers, consumer/bulk consumers, dismantlers and recyclers.

³² Electronic Waste (Management) Rules, 2016, Rule 2.

- a) *Responsibilities of Manufacturer*³³- The Rules lay down the responsibilities on the manufacturer to collect e-waste generated from any electrical and electronic equipment, and channelise the same for recycling and disposal. Furthermore, the manufacturer has a duty to ensure that no damage is caused to the environment during storage and transportation of these wastes. In order to maintain the records of the entry, the Rules mandate the filing of annual returns to the jurisdictional Pollution Control Boards before the 30th day of June.
- b) *Responsibilities of Producer*³⁴ Producers are essentially responsible for the collection and channelizing of e-waste, generated from 'end of life' products which may be recycled or disposed of. The Rule mandates EPR-Authorization for the import of electrical and electronic equipment, and also allows for the filing of annual returns till the 30th day of June. The responsibility of producer extends to providing contact details, such as the address and telephone details to consumers or bulk consumers, to facilitate the return of used electrical and electronic equipment. They must also spread awareness among bulk consumers and consumers regarding the hazards of improper handling and improper recycling of e-waste.
- c) *Responsibilities of Collection Centers*³⁵– Collection centres are the designated places for collection of e-waste on behalf of the producers, dismantlers, recyclers, or refurbishers. Securing the e-waste collected during storage and transportation without causing environmental damage is also one of the responsibilities of these collection centres. Annual returns shall be filed by them before the state PCBs on or before the 30thday of June and they must also maintain the records of the e-waste collected.
- d) Responsibilities of dealers³⁶- In order to facilitate the consumers to dispose the e-waste, dealers are to set up a box and bin and demarcate an area to deposit e-waste. They could also implement a take-back system and send the e-waste that is collected to collection centres, dismantlers or recyclers. The transportation of the e-waste generated to authorized dismantlers or recyclers is done to ensure that environmental damage is mitigated.

- 35 Id. Rule 6.
- 36 Id. Rule 7.

³³ Id. Rule 4.

³⁴ Id. Rule 5.

- e) *Responsibilities of the refurbisher*³⁷ It is the refurbisher who is responsible to collect the e-waste generated during the process of refurbishing and channelize the e-waste to authorised dismantler or recycler through its collection centre. The refurbisher has to ensure environmental damage mitigation during the storage and transportation of e-waste.
- f) *Responsibilities of Consumer or Bulk Consumer*³⁸– The e-waste generated by the consumers or bulk consumers has to be channelized to authorized collection centres through registered dismantlers or recyclers, or returned to the take-back services provided by the producers. Bulk consumers also have to maintain records of e-waste generated.
- g) *Responsibilities of Dismantler*³⁹– It is the duty of the dismantler to procure the requisite authorization and registration from the jurisdictional State Pollution Control Board. Further, the dismantler has to ensure transportation without causing damage to the environment or human health, and as prescribed by the CPCB from time to time. Some materials that are neither fit for recycling nor recoverable have to be sent to authorized treatment storage and disposal facilities.
- h) *Responsibilities of Recyclers*⁴⁰ It is the duty of those involved in recycling to ensure that the facility and recycling process shall be as per the guidelines of the CPCB and that the residue is disposed in a waste treatment storage disposal facility.

Sl. No.	Year	E-Waste Collection Target (Weight)			
(i) 2017-2018 10%		10% of the quantity of waste generation as indicated in EPR Plan.			
(ii)	2018-2019	20% of the quantity of waste generation as indicated in EPR Plan.			
(iii)	2019-2020	30% of the quantity of waste generation as indicated in EPR Plan.			
(iv)	2020-2021	40% of the quantity of waste generation as indicated in EPR Plan.			

TABLE 1: Table represents Schedule III E-Waste Collection Targets

³⁷ Id. Rule 8.

³⁸ *Id.* Rule 9.

³⁹ Id. Rule 10.

⁴⁰ Id. Rule 11.

(v)	2021-2022	50% of the quantity of waste generation as indicated in EPR Plan.
(vi)	2022-2023	60% of the quantity of waste generation as indicated in EPR Plan.
(vii)	2023-2024	70% of the quantity of waste generation as indicated in EPR Plan.

Sl. No.	Year	E-Waste Collection Target (Weight)			
(i)	2018-2019	5% of the sales figure of financial year 2016-17			
(ii)	2019-2020	5% of the sales figure of financial year 2017-18			
(iii)	2020-2021	10% of the sales figure of financial year 2018-19			
(iv)	2021-2022	10% of the sales figure of financial year 2019-20			
(v)	2022-2023	15% of the sales figure of financial year 2020-21			
(vi)	2023-2024	15% of the sales figure of financial year 2021-22			
(vii)	2024-2025 20% of the sales figure of financial year 2022-23				
(viii)	2025 onwards	25 onwards 20% of the sales figure of the year preceding the pre- year.			

TABLE 2: Table represents Set-off amount

In the year 2018, the E-Waste (Management) Amendment Rules were introduced to include the provision of *Producer Responsibility Organisation (PRO) registration. They have included Schedule III, as provided under the Table – 1. It provides for the addition of EPR targets for producers and importers, who have commenced with their business in the recent years.* There are also provisions for setting-off the collected amount at the time of fixation of targets under the Rules. Table -2 reflects this position. As per the recent amendment, the CPCB has been granted the power to conduct random sampling of electrical and electronic equipment placed in the market, to monitor and verify compliance with hazardous substances provisions. The cost for sampling and testing, which was earlier borne by producers, shall be taken care of by the government.

The Rules also provide for the liability of the manufacturer, producer, importer, transporter, refurbisher, dismantler and recycler to pay penalties prescribed under the Environment (Protection) Act, 1986.

Batteries (Management and Handling) Rules, 2001

The Rules were introduced to impose responsibilities on every manufacturer, importer, conditioner, assembler, dealer, recycler, auctioneer, consumer and bulk consumer involved in the manufacture, processing, sale, purchase and use of batteries or their components.⁴¹ The EPR principles are applied in some of the provisions which impose the following responsibilities: -

- a. Responsibilities of Manufacturer, Importer, Assembler and Re-conditioner⁴²-The Rule mentions the responsibilities of the manufacturers, importers, assembler and re-conditioners, with the latter two being excluded from some specific responsibilities. Used batteries, except those which are sold to the equipment manufacturers, are to be collected back as per the timeline specified in Schedule to the Rules against new batteries sold. They are also responsible for collecting the used batteries which are similar in type and specifications to the new sold batteries. They also have the duty to file returns of their sales and the buy-back that is to be filed before the Boards designated for the state. The manufacturers and importers in specific also have the duty to set up centres for collection, which can be done individually or jointly at several places for the collection of used batteries from their users. The mandate is also to ensure that used batteries are collected and are sent to the registered recyclers, with necessary arrangements for safe transportation. Public awareness has to be created through advertisements and other means. Recycled Lead is one of the essential contents, which can be procured from registered recyclers and any violations have to be intimated to the concerned board or Ministry for violations.
- b. Responsibilities of Dealer⁴³- The dealer shall be responsible to ensure that the batteries are collected according to the Schedule. The dealer shall also provide incentives in the form of discounts for every battery returned by the consumer. They must file yearly returns regarding the sale of new batteries and buy back of old batteries, before the 31st May and 30th November of every year. That apart, they should ensure safe transportation of collected batteries to the designated collection centres and registered recyclers.

⁴¹ Batteries (Management and Handling) Rules, 2001, Rule 2.

⁴² Id. Rule 4.

⁴³ *Id.* Rule 7.

c. *Responsibilities of Consumer or Bulk Consumer*⁴⁴– The proper disposal of the used batteries shall be the responsibility of the consumer. Moreover, the bulk consumers are responsible to file half-yearly returns with the State Board.

Solid Waste Management Rules, 2016

The Central Government notified the 2016 Rules on Solid Waste Management, replacing the Municipal Solid Wastes (Management and Handling) Rules, 2000. It was one among the six sets of rules formulated for waste management, others covering the construction, biomedical, e-waste and hazardous wastes. The data from the Ministry revealed that about 62 million tonnes of waste is generated annually in the country. 75-80% of the municipal waste gets collected and only around 22-28% of the collected waste is treated.⁴⁵ The Solid Waste Management Rules integrate the EPR aspect through some mandates.

*Mandate on manufacturers/Brand owners*⁴⁶ - Manufacturers of disposable products, including glass, tin, etc. and brand owners, who are producers/introduce such products to market, will be working closely with the local authorities by providing financial assistance to establish waste management systems. Further, the packaging material used for such products is to be collected by the brand owners or manufacturers. From the point of the sustainability principle, the provision also provides for exploring the possibility of using recyclable materials in the products, wrappers, diapers, etc. That apart, the provision to educate the masses for wrapping and disposing the products has also been emphasized.

The principle of EPR in this provision is clearly implemented, wherein the Union Government has given a clear mandate for the entities concerned to take necessary steps to ensure that the waste material generated through their product is recycled or treated properly.

The Guidelines for Environmentally Sound Management of End-of-Life Vehicles (ELVs)

The Central Pollution Control Board issued the Guidelines for Environmentally Sound Facilities for Handling, Processing and Recycling of End-of-Life Vehicles

⁴⁶ Solid Waste Management Rules, 2016, Rule 17.



⁴⁴ *Id.* Rule 10.

⁴⁵ Swati Singh Sambyal, *Government notifies new solid waste Management Rules*, DOWN TO EARTH (Sept. 19, 2018), https://www.downtoearth.org.in/news/waste/solid-waste-management-rules-2016-53443.

(ELV) in January, 2019.⁴⁷ The primary objective of these Guidelines is to ensure that the abandoned motor vehicles be managed in order to recover resources. The Guidelines include the collection, handling, transportation, storage, processing and channelization of the waste materials generated during the recycling process. The goals of the policy are to⁴⁸:

- a. Reduce open dumping of ELVs.
- b. Encourage re-use, recycling and other forms of recovery of ELVs.
- c. Reduce the uncontrolled disposal of ELVs by the semi-formal sector.
- d. Control the usage of Hazardous Substances in new vehicles.
- e. Contribute to the efficient use of resources and the retrieval of valuable secondary raw materials.
- f. Improve the environmental performance of all operators involved in the life cycle of ELVs (e.g., manufacturers, importers, distributors, consumers, collectors, dismantlers, recyclers and exporters).
- g. Set up a "Shared Responsibility" scheme.
- h. Engage consumers and businesses- Business-to-business (B2B) and Business-to- consumer (B2C).

⁴⁷ Maharashtra Pollution Control Board, Guidelines for Environmentally Sound Facilities for Handling, Processing and Recycling of End-of-Life Vehicles (ELV), https://www.mpcb.gov.in/sites/default/files/ standing_orders/Guidelines_Handling_Processing_and_Recycling_ELV_26092019_0.pdf.

⁴⁸ Id.



In the present scenario, there is no single policy or regulation which can exhaustively govern the ELVs. It requires a different policy approach for the ELVs in India as the existing national policies and regulations for ELVs include those that deal with the declaration of vehicles as ELV. Further, there are some steps in the processes of recycling of such vehicles. Regulatory framework and policy mechanism for ELVs should basically strive to provide for declaration, collection, handling, dismantling, recycling and disposal of ELVs as a 'Shared Responsibility' involving the key stakeholders such as manufacturers, dealers, consumers and recyclers. The main objective of the policy should be to address the requirements for ELV management and to put in place an effective control and monitoring mechanism on the declaration, collection, handling, dismantling, recycling and disposal of ELVs. In this regard, the consultations with stakeholders in the ELV value chain should lead to a consensus for a regulatory framework to include regulations and procedures for environmentally sound management of ELV. Once a vehicle is declared as an ELV, there is the need to regulate the handling and processing of ELVs.

CONCLUSION

In this chapter, an attempt has been made to focus on the principles of Extended Producers Responsibility (EPR). The concept, formulated by Thomas Lindhqvist, has been successfully implemented in several countries across the world. This has led to a massive change in the approach towards environmental conservation and the conservation, management and handling of resources, wherein there is a scope for recycling and reuse of the product without having to consume the fresh product. India has not lagged behind in adopting the EPR principles across various pollutionrelated laws, which have been dealt with in some detail. The implementation of these principles, however, has been a major concern, where the concerned authorities and stakeholders have to coordinate to ensure that the objectives of these instruments are achieved.

CHAPTER 5

CHEMICAL SAFETY, POISON CONTROL AND DISASTER MANAGEMENT IN INDIA

INTRODUCTION

Hazardous and chemical substances, as dangerous as they seem, cannot be barred from usage in any country, as they are important raw materials for almost all crucial sectors. They are not only used in the manufacture of chemicals but also in industrial processes, the agriculture sector for making pesticides and fertilizers and in fastmoving household goods (such as phenyl, Lysol, aerosol bug-spray and rat poison). All private and public companies in the hazardous chemicals and poisonous substance manufacturing business have reported high standards of compliance with the environmental protection and hazardous waste management laws and regulations, as well as high levels of environmental and occupational health safety. Nevertheless, incidents of environmental degradation, and occupational health and safety concerns, have come to light. It is therefore the foremost objective of this chapter to understand the manner of enforcement of these provisions by such companies and determine whether there have been any gaps in implementation.

The chapter first briefly analyses some of the best practices with respect to the implementation of chemical and poison safety laws that have been adopted in other jurisdictions. It then examines the Indian legal provisions applicable to chemical and poison safety. The chapter then analyses the level of enforcement of these laws on the part of companies handling Agro-chemicals, manufacturing chemicals, textiles, dyes, paints, resins, etc., and fast-moving consumer goods sector which manufactures poisonous substances. In specific, companies from the sub-sectors mentioned in Table 1 will be focused upon:

Agriculture Sector	INDUSTRIAL / MANUFACTURING SECTOR	Consumer Goods			
a) Insecticides	a) Paints	a) Rat-Kills			
b) Pesticides	b) Dyes and Resins	b) Aerosol Sprays			
c) Fertilizers	c) Textiles	c) Floor and Bathroom Cleaners			
	d) Oil				

TABLE-1

From these earmarked sectors, a study has been conducted on some identified companies. They have been selected on basis of their quantity of manufacture and their market presence in the particular sector. Only those companies could be selected whose documents have been uploaded on their respective websites and other portals and adequate suggestions with respect to their conduct have been put forth.

In this chapter, issues of disaster management at the Central and State level have also been analysed. Adequate importance has been given to recent accidents that have taken place in the chemical manufacturing and storage facilities across India over the past four years. Such accidents have raised the question on the efficiency of the emergency preparedness of private and public companies. This analysis shall be undertaken by briefly studying the recent disasters and by deductive reasoning, identifying the provisions that were not complied with.

CHEMICAL SAFETY AND REGULATION OF HAZARDOUS SUBSTANCES: COMPARISON OF DEVELOPED AND DEVELOPING COUNTRIES

This section will deal with the methods of enforcement of multilateral agreements on chemical and hazardous substances employed in the United States of America and Thailand. The scope will be limited to the implementation of the Basel, Stockholm, and Rotterdam Conventions and regulatory provisions incorporated in these jurisdictions for dealing with chemical accidents and disaster management.

UNITED STATES OF AMERICA

Not only is the United States the largest economy of the world, it is also the third largest manufacturer of waste on a per capita calculation.¹ Thus, waste management

¹ Hristina Byrnes & Thomas Frohlich, Canada Produces the Most Waste in the World. The US Ranks Third, USA TODAY, (July 12, 2019), https://www.usatoday.com/story/money/2019/07/12/canadaunited-states-worlds-biggest-producers-of-waste/395 34923/.

is a high priority in the United States and it has so far evolved a seemingly competent method for doing so. The United States is not a party to any of the above Conventions, since prior to ratification, specific legislation needs to be implemented. In the case of the Rotterdam and Stockholm Conventions, the US signed them in 1998 and 2001 respectively along with the Basel Convention in the year 1992, but did not ratify the former as they "presently lacked the influence to put into operation all of its provisions."^{2, 3}

Implementation

The United States in 1970 set up an independent federal agency known as the 'Environmental Protection Agency' (EPA) to implement the environmental protection laws passed by the US Congress. The EPA promulgates regulations that companies must follow and is responsible for the enforcement of these laws and regulations.⁴ In addition to this, individual states may evolve more stringent requirements to be complied with within their jurisdictions. Generally, EPA enforcement actions are of three types: (1) Civil administration actions, which do not involve any judicial process and are enforced via notice or order; (2) Civil judicial actions, which are lawsuits filed in court against persons who have not complied with statutory requirements, administrative orders or did not commit to clean-up duties; and (3) Criminal actions, which are reserved for the most serious crimes and can result in fine or imprisonment. Civil actions typically result in settlements, penalties or injunctions.⁵

Since the United States is a member of the Organisation for Economic Cooperation and Development (OECD), there are legislations aimed towards regulating the international movement of hazardous substances. The Resource Conservation and Recovery Act, 1976 (RCRA), the Comprehensive Environmental Response,

² Stockholm Convention on Persistent Organic Pollutants, US DEPT. OF STATE, https://www.state.gov/keytopicsoffice-of-environmental-quality-and-transboundary-issues/stockholm-convention-on-persistentorganic-pollutants (last visited June 19, 2020).

³ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, US DEPT. OF STATE, https://www.state.gov/key-topics-officeof-environmental-quality-and-transboundary-issues/rotterdam-convention-on-the-prior-informedconsent-procedure-for-certain-hazardous-chemicals-and-pesticides-in-international-trade (last visited June 19, 2020).

⁴ Robinson Meyer, *How the U.S. Protects the Environment, From Nixon to Trump,* THE ATLANTIC, (Mar. 29, 2017), https://www.theatlantic.com/science/archive/2017/03/how-the-epa-and-us-environmental-law-works-a-civics-guide-pruitt-trump/521001/.

⁵ *Basic Information on Enforcement*, US ENVIRONMENT PROTECTION AGENCY, https://www.epa.gov/ enforcement/basic-information-enforcement (last visited June 26, 2020).

Compensation and Liability Act (CERCLA), 1980, the Pollution Prevention Act, 1990 and the Lautenberg Chemical Safety Act, 2016 are all legislations that are enforced and implemented through the EPA. Various offices of the EPA implement their laws and policies. The Office of Chemical Safety and Pollution Prevention (OCSPP) within the EPA was established to specifically implement the regulations relating to pesticides and toxic chemicals. The Office of Pollution Prevention and Toxics (OPPT) manages programs under the TSCA and the PPA along with environmental stewardship programs that encourage companies to reduce and prevent pollution.⁶

Most of the observance monitoring accountability under the RCRA is delegated to the states and local authorities. EPA provides supervision of compliance monitoring activities in the RCRA program to ensure that facilities are methodically inspected.⁷ The RCRA Hazardous Waste Compliance Monitoring Program works in conjunction with the EPA's hazardous waste compliance assistance activities as well as the RCRA Public Enforcement Program. Inspections form an important part of the compliance procedures and inspectors are expected to scrutinize compliance in the areas of identification of hazardous waste, generation, transportation and treatment, storage and disposal facilities ("cradle-to-grave" policy).⁸ In case chemical accidents, spillages, etc. occur, the EPA is empowered through legislations such as the CERCLA to negotiate with the responsible agents for clean-up activities. It uses various cleanup authorities independently and in combinations to ensure that appropriate clean up occurs.⁹ U.S. Chemical Safety Board (CSB) is an autonomous, non-regulatory federal agency that investigates the source of key chemical incidents.

Disaster Management Policy – USA

Emergency planning is a federal requirement in the United States. The aforementioned legislations also lay down a comprehensive framework for establishing agencies to

⁶ About the Office of Chemical Safety and Pollution Prevention (OCSPP), US ENVIRONMENT PROTECTION AGENCY, https://www.epa.gov/aboutepa/about-office-chemical-safety-and-pollution-prevention-ocspp# oppt (last visited June 26, 2020).

⁷ *Resource Conservation and Recovery Act (RCRA) Compliance Monitoring*, US ENVIRONMENT PROTECTION AGENCY, https://www.epa.gov/compliance/resource-conservation-and-recovery-act-rcra-compliancemonitoring (last visited June 26, 2020).

⁸ *Hazardous Waste Compliance Monitoring*, US ENVIRONMENT PROTECTION AGENCY, https://www.epa.gov/ compliance/hazardous-waste-compliance-monitoring (last visited June 23, 2020).

⁹ *Waste, Chemical, and Cleanup Enforcement,* US ENVIRONMENT PROTECTION AGENCY, https://www.epa.gov/ enfor cement/waste-chemical-and-cleanup-enforcement (last visited June 21, 2020).

manage such disasters. For instance, Section 105 of CERCLA establishes the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), which delineates the roles of various authorities to deal with the oil discharges and hazardous substance releases. The National Response System (NRS) manages the multijurisdictional response to disasters by coordinating between various agencies. The Emergency Planning and Community Right-to-Know Act (EPCRA) formalized local hazardous material emergency planning as a component of the NRS and established the infrastructure that integrated emergency preparedness activities at all levels of government. All these agencies work in conjunction and in accordance with the regulations laid out under legislations such as RCRA. Many states also have their own laws for managing hazardous material disasters and authorities are expected to conform to them along with local fire codes, etc.¹⁰

Aside from accidents which cause immediate damage to life and environment, the EPA files numerous civil cases in the courts to enforce provisions relating to storage and transport of hazardous materials. These violations are typically discovered during inspections. Two cases discussing the aforementioned violations have been illustrated below:

First, in a recent case decided in 2017, *Innophos Inc.,* a phosphoric acid manufacturer, paid a penalty of USD 1,398,000/- under the RCR Act for shipping hazardous waste to an unpermitted facility for disposal. It had also failed to submit annual reports to the Louisiana Department of Environmental Quality and would store and treat hazardous waste in tanks without a permit at its facility. The violations were discovered during an EPA inspection visit in 2004.¹¹

Second, the chemical producer *INEOS Chlor Americas, in 2012,* had been allegedly importing various chain-length chlorinated paraffin into the United States without providing the requisite notice to EPA. The settlement decree required them to cease the manufacture of such paraffin until they provided proper pre-manufacture notices. They further agreed to pay USD 175,000/- as a civil penalty.¹² These two examples

¹⁰ NATIONAL RESPONSE TEAM, HAZARDOUS MATERIALS EMERGENCY PLANNING GUIDE (2001), https://www.epa.gov / sites/production/files/2014-09/documents/cleannrt10_12_distiller_complete.pdf.

¹¹ Innophos Resource Conservation and Recovery Act Settlement, US Environment Protection Agency (Jan. 12, 2017), https://www.epa.gov/enforcement/innophos-resource-conservation-and-recovery-act-settlement.

¹² *Ineos-Chlor Americas Settlement*, US Environment protection Agency (July 1, 2020) https://www.epa.gov/enforcement/ ineos-chlor-americas-settlement.

show that the United States has a good enforcement mechanism in place and can sufficiently meet the stringent demands placed by their various laws and enactments to preserve environmental integrity.

THAILAND

Thailand is a developing Southeast Asian country that has seen heavy industrialisation beginning in the 1980s. It is home to a number of industries, particularly in the manufacturing sector. As such, it generates a huge amount of hazardous waste which has been a problem since the 1990s when 1.9 million tons of hazardous waste was generated.¹³ After facing a significant crisis in managing these toxic wastes, Thailand underwent major policy and structural changes. These new policies and the general implementation framework in this respect have been analysed in this section. Thailand has since become a party to the Basel Convention,¹⁴ Rotterdam Convention¹⁵ and the Stockholm Convention.¹⁶

Implementation

The Government of Thailand has formed various committees for the efficient management of hazardous wastes. Further, in its 2014 National Report to the Basel Convention Secretariat, Thailand listed eleven disposal facilities including three secure landfills and fifty-five recovery facilities as operational.¹⁷

Some of the practices employed by Thailand in order to reduce waste and encourage recycling of long-lasting inorganic substances are as follows:

1. **"Used Lead-acid Battery Recycling"** is a crusade to promote recycling through tax incentives by taking into account the environmental and operational monitoring system. Up to now, 84% of used lead-acid batteries have been recycled. The movement was conceived in 2000 by the Pollution Control Department.

¹³ Rozelia S. Park, An Examination of International Environmental Racism Through the Lens of Transboundary Movement of Hazardous Wastes, 5 IND J. GLO. L. STU., 659, 703 (1998).

¹⁴ Signed in 1990, ratified in 1997.

¹⁵ Became a party via accession in 2002.

¹⁶ Signed in 2002, ratified in 2005.

¹⁷ D.W.H SURAADININGRAT, REGIONAL STUDY ON MERCURY WASTE MANAGEMENT IN THE ASEAN COUNTRIES, (2017), https://wedocs.unep.org/bitstream/handle/20.500.11822/21135/reg_study_mercury_waste_mgt_ asean.pdf?.

- 2. Thailand Institute of Packaging and Recycling Management for Sustainable Environment is a non-profit organisation established in 2005 by the Federation of Thai Industries. TIPMSE was established to promote (1) segregation at source of used packaging from garbage in order to decrease quantity of used packaging in the waste countrywide; (2) a suitable administration system for used packaging and cast-off materials. The research indicated that recycle rate of packaging materials in Thailand during 2013 was around 85%.¹⁸
- 3. To deal with the plastic catastrophe, they implemented a national level campaign to raise consciousness about injurious effects of plastic wastes.¹⁹

In addition to policy initiatives such as the Pollution Prevention and Mitigation Policy 1997-2016, Pollution Control and Management Plan 2012-2016, Environmental Management Plan 2007-2011, etc., waste management in Thailand is governed by specific laws and regulations including, but not limited to the Hazardous Substances Act, B.E. 2535 (1992), the Factory Act, B.E. 2535 (1992), the Public Health Act, B.E. 2535 (1992), and the Enhancement and Conservation of National Environmental Quality Act, B.E. 2535 (1992).

Disaster Management Policy – Thailand

The National Disaster Prevention and Mitigation Committee (NDPMC), chaired by the Prime Minister, is the body that formulates the National Disaster Prevention Mitigation Plan and integrates the development of disaster management system.²⁰ The National Safety Council of Thailand is the main body responsible for developing policies for management of man-made disasters including chemical accidents. The policies are implemented through the National Disaster Command Headquarters (NDCH) which coordinates with agencies established at all levels of government. The Operations Sections of the NDCH is responsible for chemical and hazardous substance emergency response.²¹

¹⁸ *Id*.

¹⁹ Environmental issues won't solve themselves, The NATION THAILAND (Feb. 07, 2019), https://www.nationthailand.com/opinion/30 363754.

²⁰ National Institute of Disaster Mangement, Country Profile: Thailand, https://nidm.gov.in/easindia2014/ err/pdf/ country_profile/Thailand.pdf (last visited July 14, 2020).

²¹ NATIONAL DISASTER RISK MANAGEMENT PLAN (2015), https://www.preventionweb.net/files/54086_54086thailandsnationaldrmplan2015.pdf.

A fire at *Bangkok's port complex in 1991* ignited 640 metal cylinders containing methyl bromide, destroyed 600 homes and officially killed only 5 people. In the days that followed, 30,000 people fell sick, small explosions occurred intermittently and contents of other drums spilled onto the ground through gaping ruptures in the metal. The incident brought Thailand's extremely lax chemical safety laws to light and also showed that Bangkok was the unofficial dumping ground of unwanted chemicals from developed nations.²² In *2012, two accidents* occurred back-to-back. Twelve people were killed and over 140 injured in an explosion at a synthetic rubber plant (owned by Bangkok Synthetics) at Map Tu Phut. On May 6, chlorine gas leaked out of a hydrochloric acid plant (operated by *Aditya Birla Chemicals*) which led to the hospitalization of 13 people.²³

Most recently, two workers died in 2018 while mixing potassium chlorate and gunpowder to put into firework packages in an unlicensed firework manufacturing factory, again in Chiang Mai.²⁴ A deeper analysis of factory accidents in Thailand that occurred between 2001 to 2017 revealed that most accidents especially hazardous materials, fire, explosion and toxic release are caused due to the irregular handling, storing and managing beyond the approved capabilities.²⁵ This, along with the ongoing e-waste crisis, definitively portrays that enforcement of hazardous waste policies in Thailand is significantly lacking.

Issues and Challenges

A major chunk of hazardous waste produced in Thailand is e-waste. Since China imposed a ban on import of e-waste in 2017, Thailand has emerged as one of the major hubs for illegal dumping of e-waste from USA and Europe.²⁶ Despite the ban on

²² Charles Wallace, Environment: Bangkok Fire Raises Some Toxic Issues: Countries such as Thailand have become the lucrative dumping ground for chemical waste from industrialised nations. Can these countries survive the economic gain?, Los Angeles Times (April 2, 1991), https://www.latimes.com/ archives/la-xpm-1991-04-02-wr-1884-story.html.

²³ Jean-Francoise Tremblay, *Explosion in Thailand Kills 12*, Chemical & Engineering News (May 14, 2012), https://cen.acs.org/a rticles/90/i20/Explosion-Thailand-Kills-12.html.

²⁴ *Two killed in blast at unlicensed fireworks factory*, The NATION THAILAND (Nov. 16, 2018), https://www.nationthailand.com/news/ 30358714.

²⁵ Pennapa Tungjiratthitika, *Accidents in Thai Industry between 2001 and 2017*, 5(2) JT. J NOVEL CAR. Res. Sci. G. Asia Strat. 86, 89 (2018).

²⁶ Caratlux Liumpetch, *Tackling Thailand's hazardous waste control crisis*, (Opinion) The BANGKOK Post (July 11, 2018), https://www.bangkokpost.com/opinion/opinion/ 1501322/tackling-thailandshazardous-waste-control-crisis.

import of 432 types of electronic waste,²⁷ the amount of e-waste in the country seems to be on an upward trend. Most disturbingly, the government stance on the illegal imports appears to be two pronged: (1) denial of the problem, and (2) loosening of environment and labour laws.²⁸ As per the Pollution Control Department's Thailand State of Pollution 2016 Report, the Thai industrial sector generated 2.8 million tonnes of hazardous waste.

BEST PRACTICES IN THE IMPLEMENTATION OF HAZARDOUS CHEMICAL LAWS ACROSS JURISDICTIONS: A COMPARATIVE PERSPECTIVE

Internationally, both developed and developing countries have adopted efficient laws and implementation mechanisms to ensure chemical safety and poison control. For the purposes of this chapter, the experiences of 2 countries (USA and Thailand) and 1 supranational organisation (the EU) have been analysed. The same have adopted various best practices, which are as under:

²⁷ Panarat Thepgumpanat, *Thailand to ban imports of high-tech trash, plastic waste*, REUTERS (Aug. 16, 2018), https://www.reuters.com/article/us-thailand-environment-waste/thailand-to-ban-imports-of-high-tech-trash-plastic-waste-idUSKBN1L10QW.

²⁸ Hannah Beech, et al., *The Price of Recycling Old Laptops: Toxic Fumes in Thailand's Lungs*, NY TIMES (Dec. 08, 2019), https://www.nytimes.com/2019/12/08/world/asia/e-waste-thailand-southeast-asia. html.

From the United States		From the European Union		FROM THAILAND	
1. Presence of an independent environmental agency empow implement laws and regulation capable of conducting clean-u	vered to ons and ups as and	France: Bonus in license fee to reduce production of waste and increase recycling	1.	Promotional campaigns to raise awareness. ³³	
when necessary– the Environ Protection Agency. ²⁹	mental	by industries. ³¹	2.	Tax incentives to increase recycling	
2. Regular inspection and follow industries and factories for ch	<i>x</i> -up of all ecking	Scotland: Criminalises the assembly and sale of rinse-off		and reduce usage. ³⁴	
 Decentralisation of the compliched checking mechanisms, as each its own environment department protection agency (along with in the law, as approved and rewhich works in tandem with the agency.³⁰ 	iance h state has eent and c changes equired) he federal	personal care products containing plastic micro beads. ³²	3.	Promotion of at- source segregation of waste to facilitate proper disposal. ³⁵	
4. Fast resolution of environment in the courts of justice and im-	ntal cases position of				
hefty fines that act as deterred	nts.				

TABLE- 2

Some of these best practices can also be adopted in the Indian context. Their relevance in the Indian context will be discussed in the later part of the chapter.

²⁹ Michael P. Wilson & Megan R. Schwarzman, *Toward a New U.S. Chemicals Policy: Rebuilding the Foundation to Advance New Science, Green Chemistry, and Environmental Health*, ENVIRON HEALTH PERSPECT 1202 (2009).

³⁰ *Toxic Substances Control Act (TSCA) Compliance Monitoring*, US EPA, https://www.epa.gov/ compliance/toxic-substances-control-act-tsca-compliance-monitoring (last visited Dec. 26, 2020).

³¹ E. Watkins et al, EPR in the EU Plastics Strategy and the Circular Economy: A Focus on PlasticPackaging (2017).

³² *Scotland Proposes Microbeads Ban in the Manufacture of Rinse-off Personal Care Products*, Consumer and Retail Services, https://crs.ul.com/en/news-events/scotland-proposes-microbeads-ban-manufacture-rinse-off-personal-care-products/ (last visited Dec. 16, 2020).

^{33 1} UNITED NATIONS DEVELOPMENT PROGRAMME, THAILAND'S BEST PRACTICES AND LESSONS LEARNED IN DEVELOPMENT, http://www.in.undp.org/content/dam/thailand/docs/TICAUNDPbpVol1.pdf (last visited Dec. 16, 2020).

³⁴ Dr.Wijarn Simachaya, *Moving Towards Zero Waste and Sound Management of Chemicals*, https://sustainabledevelopment.un.org/content/documents/430thailand.pdf (last visited Dec. 16, 2020).

³⁵ Id.
THE LEGISLATIVE FRAMEWORK WITH RESPECT TO CHEMICAL AND POISON SAFETY AND DISASTER MANAGEMENT IN INDIA

The laws relevant to chemical safety and chemical disaster management have been discussed in the other chapters. However, they have been briefly outlined hereunder:

Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989

These Rules have been framed under the Environment (Protection Act), 1986. Rule 4 casts a general responsibility of the occupier during industrial activity.³⁶ The occupier is obliged to provide evidence to show that he has identified major accident hazards. Also, it is to be shown that he has taken enough steps, *first*, to avert major accidents and to limit their cost to persons and the environment, and *second*, to provide to persons working on the spot with the information, training and equipment including antidotes necessary to ensure their safety.³⁷

Rules 7-15 apply to industrial activities or isolated storages involving more than the threshold quantities of hazardous chemicals as listed in Schedules 2 and 3.³⁸ An occupier cannot undertake such industrial activity unless he prepares and submits a safety report to the authority concerned.³⁹ He is also required to carry out an autonomous safety audit and its report is to be updated every year.⁴⁰

Rule 13 requires the occupier to prepare and keep updated an *on-site emergency plan*. It is to detail how significant mishaps will be managed on the site on which the industrial activity is continued. The plan must incorporate the name of the individual who is liable for well being on the site and the names of the individuals who are authorized to make a move as per the plan in case of a mishap.⁴¹ *Rule 15* seeks to ensure the safety of persons off-site. The occupier has to take appropriate steps to provide certain information, either directly or through District Emergency Authority, to persons outside the site who are likely to be in an area that may be affected by a major accident. Such information must be regarding the accident's nature, the safety measures taken by the occupier and dos and don'ts to be adopted.

- 39 Id. Rule 10(1).
- 40 *Id.* Rules 10(4)-(6).

³⁶ Manufacture Storage and Import of Hazardous Chemical Rules, 1989, Rule 4 (the Rule is applicable to industrial activities or isolated storages as can be ascertained by having look at the Schedules 1 and 2. These Schedules lists many chemicals used in agricultural sector).

³⁷ Id. Rule 4(2).

³⁸ Id. Rule 6(1).

⁴¹ *Id.* Rule 14(1).

Chemical Accidents (Emergency Planning Preparedness and Response) Rules, 1996

These Rules have also been framed under the Environment (Protection Act), 1986 to deal with chemical emergencies. 'Chemical accident' has been defined as an accident involving an unexpected, sudden or unintended incidence while handling any hazardous chemicals, where such an incidence could lead to incessant, irregular or recurring exposure to casualty, or injury to, any person, or harm to any property. It, however, does not include an accident by reason only of war or radioactivity.⁴²

The Central Government is required to constitute a *Central Crisis Group* and a *Crisis Alert System* for the management of chemical accidents.⁴³ The Group is the apex body to deal with major chemical accidents and to provide expert guidance in handling them.⁴⁴ It continuously monitors post-accident situation, suggests measures for prevention and checks recurrence of accidents.⁴⁵ It also reviews district off-site emergency plans to adjudge their adequacy in accordance with MISHC Rules, and the growth reports submitted by the State Crisis Groups.⁴⁶ The States also have to constitute *State Crisis Group* and *District and Local Crisis Groups* for management of chemical accidents. The functions of the former given under Rule 7 include reviewing all district off-site emergency plans and forwarding report to Central Crisis Group, assisting the State Government, reviewing the progress report submitted by the District Crisis Groups, etc.

The *District and Local Groups* perform functions as mentioned in Rules 9 and 10. The District Crisis Group assists in the preparation of the district off-site emergency plan, reviews all the on-site emergency plans prepared by the occupier of Major Accident Hazards installation for the preparation of the district off-site emergency plan, assists the district administration in the management of chemical accidents at a site lying within the district, constantly monitoring every chemical accident, and ensures flow of information between crisis groups. The Local Crisis Group is a body in the industrial pocket to put in order a local emergency plan, to unite this plan with

⁴² Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996, Rule 2(a).

⁴³ Id. Rule 3.

⁴⁴ *Id*. Rule 5(1).

⁴⁵ *Id.* Rule 5(2)(a).

⁴⁶ *Id.* Rules 5(2)(c) and (d).

district off-site management plan, to train workers involved in chemical accident management, to train population about accident remedies and awareness and to respond to public queries.

Disaster Management Act, 2005

The Disaster Management Act spearheads and adopts an all-encompassing and coordinated way to deal with calamity by providing for an institutional system at three levels- Central, State and District. The Fiasco Management Policy, 2009 imagined this to be a change in outlook: from the past help-driven reaction to a proactive avoidance, alleviation-and-readiness-driven methodology, for saving formative additions and to limit fatalities, damage to livelihoods and property.⁴⁷

The National Disaster Management Authority and National Executive Committee

The National Disaster Management Authority, established by Central Government under *Section 3*, bears the responsibility for laying down the policies, procedure and guiding principles for ensuring timely and efficient response to disaster.⁴⁸ It approves the National Disaster Management Plan, which is drawn up under Section 11 for the whole country, approves the plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan, and lays down a course of action to be followed by the State Authorities in drawing up the State Plan.⁴⁹ The NDMA is assisted in its functioning by National Executive Committee.⁵⁰ The Committee has the responsibility for implementing the policies and plans of the National Authority and ensuring the compliance of directions issued by the Central Government for disaster management.⁵¹

State Disaster Management Authority and State Executive Committee

Each State needs to establish a State Disaster Management Authority. According to Section 18, SDMAs have the duty regarding setting down strategies and plans for calamities in the State. It approves the State plan, examines the state executives' plans,

50 *Id.* § 8.

⁴⁷ The Disaster Management Act, 2005.

⁴⁸ Id. § 6(1).

⁴⁹ Id. § 6(2).

⁵¹ *Id.* § 10.

etc. The State Executive Committee, to be established according to Section 20, helps the State Authority in the discharge of its functions. The advisory group readies the State Plan as indicated by Section 23, and the same is to be inspected and refreshed yearly. The advisory group additionally facilitates and screens the execution of the National Policy, the National Plan, and the State Plan. Under Section 24, the State Committee has been provided with powers and capacities in case of undermining fiasco circumstances. These include controlling and safeguarding vehicular traffic; removing the debris, leading search and rescue operations; and directing the State Government's Departments, or the district local authorities.

District Disaster Management Authority

The District Disaster Management Authority, set up under Section 25 for each district in the State, exercises such powers and functions as laid under Section 30. By and large, it goes about as the district planning, organizing and executing body for management of disaster and takes all measures for the said purpose as per the rules set by the National and State Authority. Section 30(2) requires the Authority to prepare a disaster management plan, including a district response plan, for the district; ensure that the areas in the district vulnerable to disasters are identified and measures for the prevention of disasters and the mitigation of its effects are undertaken by the departments of the Government at the district level as well as by the local authorities; ensure that the guidelines for prevention of disasters, mitigation of its effects, preparedness and response measures as laid down by the National Authority and the State Authority are followed by all departments of the Government at the district level and the local authorities in the district; arrange and screen the execution of the National Policy, State Policy, National Plan, State Plan and District Plan; give directions to various specialists at the district level and local authorities to take such other measures for the prevention or mitigation of disasters as may be necessary; compose and facilitate specific capacity building programs for various degrees of officials, representatives and willful salvage laborers in the region; encourage network preparation and mindfulness programs in anticipation of disasters, with the help of nearby specialists and legislative and non-administrative associations; set up, keep up, audit and update for early alerts and keeping data available for dissemination.

Powers and Functions of District Authority in case of Threatening Disaster Situation, under Section 34, include giving directions for the release and use of resources available with any Department of the Government and the local authority in the district; control and restrict vehicular traffic; remove debris and conduct search and carry out rescue operations; recommend necessary measures to any Department of the Government of the State or any authority or body under that Government at the district level, etc.

Role of the Government and Local Authorities- Chapter V of the Act provides for the Central and State Governments' role. The Central Government shall take all such measures as it deems necessary or expedient for the purpose of disaster management.⁵² Each State Government shall take all measures specified in the guidelines laid down by the National Authority and such further measures as it deems necessary or expedient for disaster management.⁵³

"Local authority" includes Panchayati raj institutions, municipalities, a district board, cantonment board, town planning authority or Zila Parishad or any other body or authority, by whatever name called, for the time being invested by law with rendering essential services or with the control and management of civic services, within a specified local area.⁵⁴ These authorities act as per the directions of District Authority for the prevention and mitigation of disasters. They may take such other measures as may be necessary for managing the disaster.

National Disaster Response Force (NDRF) - Section 44 mandates the constitution of a National Disaster Response Force (NDRF). Its purpose is to provide specialist response to a threatening disaster situation or disaster. According to **Section 45**, the general superintendence, direction and control of the Force is vested with and exercised by the National Authority. Also, the command and supervision of the Force shall vest with an officer to be appointed by the Central Government as the Director General of the National Disaster Response Force.

State Disaster Response Force (SDRF) and Other Important Institutional Arrangements as Per DM Policy, 2009- As per Clause 3.4.5 of National Policy on Disaster Management, 2009, the State Governments are required to raise

⁵² *Id.* § 35.

⁵³ Id. § 38.

⁵⁴ Id. § 2(h).

their own SDRFs for rapidly reacting to accidents. The SDRFs are put deliberately at appropriate areas such as air terminals, rail heads and streets, for their prompt dispatch to the catastrophe locales. They are also to be utilized for Community Capacity Building and Awareness Generation Programs within the State. During these projects, SDRFs can acclimate themselves with the territory, basic structures and other existing foundations of the area concerned for quick reactions at the hour of calamities. They can also network with locals, including younger students, town volunteers and different partners, on the course of action during accidents. In addition to placing responsibilities on these actors, the DM Policy, 2009 specifies Armed Forces, Central Paramilitary Forces, State Police Forces and Fire Services, Civil Defense and Home Guards, NCC, NSS, NYKS, etc. to have tasks to carry out in case of a disaster.

Managing Chemical Disasters under the National Disaster Management Plan of 2019

In so far as the management of industrial chemical disasters is concerned, the National Disaster Management Plan of 2019 has identified responsibilities for different institutions and authorities in the Central and the State Government to identify risk of chemical disasters, ensure inter-agency coordination, capacity development and investing in structural and non-structural measures of disaster risk reduction.

LEGISLATIVE FRAMEWORK FOR POISON CONTROL

While standalone chapters on agrochemicals and pharmaceuticals in Part C of the book have dealt with legislations governing these sectors in detail, this chapter highlights the provisions of these instruments with specific emphasis on poison safety.

The Insecticides Sector

Insecticides can be poisonous to humans and animals. They can cause harm to the environment. Consequently, the Insecticides Act, 1968 was enacted to regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view of preventing risk to human beings or animals,⁵⁵ and for matters connected therewith.

⁵⁵ The Insecticides Act, 1968, § 3(a) ("*Animals*" in this context shall mean, animals useful to human beings, including fish and fowl, and such other wildlife which Central Government thinks desirable to protect and preserve).

Insecticides Act, 1968

The Act helps in poison safety in following ways- The Central Government constitutes the Central Insecticides Board which advises the Central and State governments on matters including:

- (a) the risk to human beings or animals through the use of insecticides and the safety measures necessary to prevent such risk;
- (b) the produce, sale, storage, transport and distribution of insecticides with a view to ensure the safety to human beings or animals.⁵⁶

The Registration Committee constituted under Section 5 also helps in poison safety. Among other functions, it has to list insecticides after thorough scrutiny of their formulae and verifying claims made by the importer or the manufacturer, as the case may be, as regards their usefulness and safety to human beings and animals. Section 9 requires registration of insecticides before they can be imported or manufactured. A person intending to import or manufacture an insecticide has to apply to the Registration Committee for registration. Only after necessary enquiry and satisfaction that the insecticide conforms to the claims made by the importer or by the manufacturer, as the case may be, as regards the efficacy of the insecticide and its safety to human beings and animals, can the Committee register the insecticide on conditions specified by it. The Committee may refuse to list the same if it is of the view that the safety measures being claimed as adequate by the applicant are not practicable, or that notwithstanding the observance of such precautions the use of the insecticide involves serious risk to human beings or animals.

As per *Section 13*, a person desiring to manufacture, or to sell, stock, distribute or exhibit for sale any insecticide, or to undertake commercial pest control operations with the use of any insecticide, has to have a license from the licensing officer. Licensing officers are appointed by the State government. Sections 17 and 18 prohibit the import, manufacture, sale, etc., of certain insecticides. For example, misbranded insecticides' import and manufacture are prohibited. Misbranding, according to Section 3(k), can be because of several reasons. Particular to be noted is that misbranding happens if insecticide's label does not contain a warning or caution which may be necessary and sufficient, if complied with, to prevent risk to human beings or animals. If, with respect to any insecticide there is contravention of provisions of the Act, then it is liable to be confiscated.⁵⁷

⁵⁶ Id. § 4.

⁵⁷ Id. § 25.

Another Section aiding in poison safety is *Section 26* which states that "any person or class of persons, as specified by the State Government, has/have to report all occurrence of poisoning, happening because of usage or handling of insecticides, which come into his/their cognizance". Further, Section 27, provides that, "if on the basis of such report or otherwise, the Central/State Government thinks, use of the insecticide is likely to involve such risk to human beings or animals as to render it expedient or necessary to take immediate action, it may prohibit the sale, distribution or use of the insecticide."

Labelling- Rule 17(1) of the Insecticides Rules, 1971 mandates the package containing insecticides to be of the type approved by the Registration Committee. The package containing insecticide is required, under Rule 18, to include a leaflet containing several details. Such details, for example, include the instructions concerning the decontamination or safe disposal of used containers and the manner in which the insecticide is to be applied.

Thereafter, *Rule 19* prescribes the procedure of labelling. Labels are to be of the prescribed size and contain relevant safety information. There shall also be a safety pictogram, one per label, at the bottom in respect of labels of minimum size. Similar requirements can be seen in case of bottle containers. Additionally, as per Rule 19(3), in case the package contains highly inflammable insecticides, the label shall indicate the same or that the insecticide should be kept away from heat or open flame. Furthermore, Rule 19(8) prohibits unwarranted claims for the safety of the product or its ingredients. This includes statements such as "Safe", "Non-Poisonous", "Non-Injurious" or "Harmless", with or without such qualifier phrase as "*when used as directed*".

The Pharmaceutical / Drugs and Cosmetics Sector

The Drugs and Cosmetics Act, 1940 - It was enacted to regulate the import, manufacture, distribution or sale of drugs and cosmetics. Clearly, a drug or cosmetic which is not safe or is toxic or has toxic substances cannot be allowed to be imported, manufactured, sold or distributed. Several provisions of the Act, thus, either directly or indirectly, aid in poison control and safety. For safety, it is imperative that drugs and cosmetics comply with standards of quality, are labelled properly and are not adulterated.

A drug is deemed misbranded under the Act if: (a) it is so coloured, coated, powdered or polished that damage is concealed or if it is made to appear of better or greater therapeutic value than it really is; (b) it is not labelled in the prescribed manner; or (c) its label or container or anything accompanying the drug bears any statement, design or device which makes any false claim for the drug or which is false or misleading.⁵⁸ A cosmetic is deemed misbranded under the Act if: (a) it contains a colour which is not prescribed; or (b) it is not labelled in the prescribed manner; or (c) the label or container or anything accompanying the cosmetic bears any statement which is false or misleading in any particular.⁵⁹

Labelling of drugs as a Measure of Poison Safety

All drugs can be poisonous if taken in high dosages. A drug may also turn toxic after its expiry date. It is, therefore, imperative that proper labeling- mentioning safe dosages, circumstances for safe use, expiry date, the proportion of contents, etc. is done. Accordingly, import,⁶⁰ manufacture, sale and distribution⁶¹ of misbranded and adulterated drugs and cosmetics are prohibited under the Act. In case of some drugs, there are chances of addiction and hence, over-dosage. It is necessary in these cases that certain caution signs indicate the same on the label.

Labelling of Drugs other than Homeopathic Medicines - Labeling requirements mandate certain particulars to be printed or written in indelible ink and appear conspicuously on the label of the innermost container of any drug.⁶² Such particulars are also to appear on every other covering in which the container is packed.⁶³ There has to be a correct declaration of the net contents in terms of weight, measure, volume, number of units of contents, number of units of activity, as the case may be.⁶⁴ The weight, measure and volume are to be expressed in metric system. The names of active ingredients should also be present, and the contents are to be in appropriate terms for different preparations/drugs/tablets.⁶⁵ The mention of expiry

- 62 Drugs and Cosmetics Rules, 1945, Rule 96(1).
- 63 Id.
- 64 *Id.* Rule 96(1)(ii).
- 65 *Id.* Rule 96(1)(iii).

⁵⁸ The Drugs and Cosmetics Act, 1940, § 9.

⁵⁹ Id. §§ 9(C), 17(C).

⁶⁰ *Id.* § 10.

⁶¹ Id. §§ 18; 33EEEC.

dates is an essential condition.⁶⁶ Drugs and their preparations shall bear on their labels the date of their manufacture and also the date of their expiry. The date of expiry is not to surpass sixty months from the date of manufacture.

Narcotic analgesic, hypnotics, sedatives, tranquillizers, corticosteroids, hormones, hypoglycemics, antimicrobials, anti-epileptics, anti-depressants, anti-coagulants, anti-cancer drugs and all other drugs falling under Schedules G, H and X, are to bear on the label of the innermost container, a conspicuous red vertical line on the left, running throughout the body of the label.⁶⁷ It should not be less than 1mm in width.

Cosmetics and Labelling - The inner and outer labels must contain the "use before" date in months and years.⁶⁸ A cosmetic must carry on its outer label a declaration of net contents.⁶⁹ On the inner label, where a hazard exists, there must be(a) adequate direction for safe use; (b) any warning, caution or special direction required to be observed by the consumer; (c) a statement of the names and quantities of the ingredients that are hazardous or poisonous.⁷⁰ The list of ingredients present in concentration of more than one per cent shall be listed in the descending order of weight or volume at the time they are added.⁷¹

Labelling of Hair Dyes containing Dyes, Colours and Pigments- Rule 149 mandates that hair dyes containing Para-Phenylenediamine or other dyes, colours and pigments shall be labelled with the specified legend in English and local languages. These legends shall appear on both the inner and the outer labels. Each package should also contain instructions in English and local languages for carrying out the test, as have been mentioned in the provision.

Special provisions relating to toothpaste containing fluoride⁷²- Toothpastes with fluorides should specially adhere to the following: (i) Fluoride content in toothpaste shall not be more than 1000 ppm and the content of fluoride in terms of ppm shall be mentioned on the tube and carton; (ii) Date of expiry should be mentioned on tube and carton.

- 69 *Id.* Rule 148(2).
- 70 *Id.* Rule 148(3).
- 71 *Id.* Rule 148(7).
- 72 *Id.* Rule 149(A).

⁶⁶ Id. Rule 96(1)(vii) & (viii).

⁶⁷ *Id.* Rule 96(1)(ix).

⁶⁸ *Id.* Rule 148(1)(c).

A Sectoral Study of Implementation of Chemical and Poison Safety Laws by Indian Companies

Companies in the Agro-Chemical Industry

The agriculture sector in India has a very large role to play as maximum number of people rely on this sector for their livelihood. Farmers either working on a large scale or small scale use a variety of chemical insecticides, pesticides and fertilizers in their fields to ensure a good harvest. Thus, the companies, manufacturing these products largely are regulated by the guidelines.

Zuari Agro-Chemicals Ltd. [Adventz Group of Companies]

The MoEF's Expert Appraisal Committee cleared the proposed expansion of the urea plant of this company on 26th September, 2018 subject to fulfillment of certain conditions. However, in 2019, the MoEF decided to put a stay on the project till the Coastal Zone Management Plan for the area was completed. This project faced resistance and criticism from environmentalists and locals due to environmental issues and the nature of activities being proposed as a part of the plant.

Information regarding Chemical Safety and Hazardous Substances furnished by the company for the new plant:

1. **Disposal of Waste:** The plant is based on the recycle model, as a result of which there is no discharge or liquid effluent released from the plant. The company has assured disposal of used oil and other contaminated containers as per the practice and approval of the Goa State Pollution Control Board and Central Board. It was anticipated that there would not be release of any additional hazardous waste. Water streams and treated domestic effluents were proposed to be recycled for the complex fertilizer plants.

2. Usage and Release of Hazardous Substances-

- a. Phosphoric Acid, Ammonia, $\rm H_{2}SO_{4}and$ NG/RLNG are already being actively used in the plant.
- b. Minimal emissions of Nitrogen Oxide (NOx) from combustion of fossil fuels.
- c. Release of dust emissions, $\mathrm{SO}_{_2}$, NOx, Particulate Matter and Ammonia due to production.
- d. Reduction in CO_2 and SOC_2 emissions due to the change of fuel from Naphtha to NG/RLNG.

- e. Installment of modern burners to reduce NOx emissions.
- f. No open venting of vessels releasing harmful chemicals.
- 3. **Containment Risks-** As per the submission, the Sulphuric Acid spillage, although present, was undertaken to be controlled by impervious flooring, washing and recycling with the use of a scrubbing system. No additional emissions were proposed from the fertilizer plants.
- 4. **Risk and Impact on Human Resources** The proposed project did not involve usage of hazardous substances and in compliance with the safety norms, it was assured that the labourers shall be provided with PPE in addition to providing them and their supervisors adequate training. Additionally, fire safety measures were also adopted. The project was granted environmental clearance by the Ministry subject to fulfilment of certain conditions pertaining to chemical safety and hazardous waste, as mentioned below
 - a. Treatment of Industrial and domestic effluents in accordance with the provisions of the Environment Protection Rules, 1986 or the rules laid down by the Gujarat Pollution Control Board (GPCB).
 - b. Gas emissions rules must be adequately complied with.
 - c. Installation of air pollution control systems to minimize gaseous emissions.
 - d. Adoption of measures to limit ammonia emissions.
- 5. **Final EIA and EMP Report for the Project-Environmental clearance**⁷³ **[Sep.2016]-** Since the proposed expansion of the project was an integrated fertilizers and chemicals project, the application for EC was filed before the Expert Appraisal Committee and MoEF, to be considered as an integrated project. The following clearances have been obtained by the company for the plant w.r.t chemical safety and hazardous waste: Factories Act, 1948; Manufacture, Storage and Import of Hazardous Chemical Rules, 1989; Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016; Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996; The Explosives Act, 1884; The Explosive Rules, 1983; Gas Cylinder Rules, 2004; Static and Mobile Pressure Vessels (Unfired) Rules, 1981

⁷³ Final EIA & EMP Report for Fertilizer Blending unit for Customized NPK Prodcution, Gas Turbine (GT), Heat Recovery Steam Generator (HRSG), Atmospheric Ammonia Storage Tank (AAST) & Urea Granulation Unit for Fertilizers Production at Zuarinagar, Sancoale Village, Mormugao Taluka, South Goa District, Goa, Environment Clearance, http://environmentclearance.nic.in/writereaddata/ EIA/27092016D1UE92HQAnnexure-documentofEIA&EMP.pdf (last visited June 21, 2020).

6. Environmental Statements^{74, 75, 76, 77, 78}

Analysis of the Compliance Status of Zuari Agro-Chemicals Ltd

2018-19	2017-18	2016-17	2015-16
The account furnished	The account furnished	As per the statement,	As per the statement,
with respect to	with respect to	the discharge and	the discharge and
the generation of	the generation of	gaseous emissions	gaseous emissions
hazardous waste in	Hazardous waste in	is less than the	is less than the
compliance with the	compliance with the	prescribed standards.	prescribed standards.
Hazardous and Other	Hazardous and Other	The account furnished	However, the
Wastes (Management	Wastes (Management	with respect to	account furnished
and Transboundary	and Transboundary	the generation of	with respect to
Movement) Rules,	Movement) Rules,	Hazardous waste in	the generation of
2016 for the FY 2018-	2016for the FY 2017-18	compliance with the	Hazardous waste in
19 is higher than in	is higher than in 2016-	Hazardous and Other	compliance with the
2017-18.	17 (Used oil and Spent	Wastes (Management	Hazardous and Other
As per the statement	Catalyst) and lower	and Transboundary	Wastes (Management
the discharge and	for Furnace Oil tank	Movement) Rules,	and Transboundary
gaseous emissions	cleaning sludge.	2016 for the FY 2016-	Movement) Rules,
is less than the	As per the statement	17 is lower than in	2016for the FY 2015-
prescribed standards	the discharge and	2015-16.	16 is higher than in
preseribed standards.	gaseous emissions is		2014-15.
	less than the prescribed		
	standards.		

TABLE-6

⁷⁴ *Environmental Statement for the year 2014-15*, ZUARI AGRO-CHEMICALS LTD, https://www.zuari.in/assets/ files/Sustainability/Environment/Envt-Statement-2015-16.pdf (last visited June 21, 2020).

⁷⁵ Environmental Statement for the year 2017-18, ZUARI AGRO-CHEMICALS LTD, http://zuari.in/assets/files/ Sustainability/Environment/Envt-Statement-2017-18.pdf (last visited June 21, 2020).

⁷⁶ *Environmental Statement for the year 2015-16*, ZUARI AGRO-CHEMICALS LTD, https://www.zuari.in/assets/files/Sustainability/Environment/Environmental-Statement-for-the-year-2015-16.pdf (last visited June 21, 2020).

⁷⁷ Environmental Statement for the year 2018-19, ZUARI AGRO-CHEMICALS LTD, http://zuari.in/assets/files/ Sustainability/Environment/EnvStatement2018-19.pdf (last visited June 21, 2020).

⁷⁸ Environmental Statement for the year 2016-17, ZUARI AGRO-CHEMICALS LTD, https://www.zuari.in/assets/files/Sustainability/Environment/Envt-Statement-2016-17.pdf (last visited June 21, 2020).

Applicable Laws	Company's Response	INFERENCE
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016Rule 4(3) Requires that the hazardous and other wastes generated in the establishment of an occupier shall be sent or sold to an authorised actual user or shall be disposed of in an authorised disposal facility.	Zuari, as per its Environmental Statements, sells it to a recycler registered with CPCB and authorized by SPCB.	This implies sufficient compliance of these provisions.
Moreover, Rule 6 requires that every occupier of the facility who is engaged in handling, generation, collection, storage, packaging, transportation, use, treatment, processing, recycling, recovery, pre- processing, co-processing, utilisation, offering for sale, transfer or disposal of the hazardous and other wastes shall be required to make an application in Form 1 to the State Pollution Control Board and obtain an authorisation from the State Pollution Control Board within a period of sixty days from the date of publication of these rules.	Zuari, as per its Environmental Statements, sells it to a recycler registered with CPCB and authorized by SPCB.	This implies sufficient compliance of these provisions.
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 Rule 4(6) requires that the occupier shall take all the steps while managing hazardous and other wastes to- (a) contain contaminants and prevent accidents and limit their consequences on human beings and the environment; and (b) provide persons working in the site with appropriate training, equipment and the information necessary to ensure their safety.	The company conducts regular surveillance over stack emissions. Natural gas/ Ammonia/ Chlorine sensors have been installed within the plant premises for detection of leaks and corrective measures.	Implies company is working towards containing contaminants. The measures mentioned will aid in preventing accidents as required by the provision,

TABLE-7

HWM, 2008, Rule 5(8) requires that the occupier or operator of the facility shall take all the steps, wherever required, for reduction and prevention of the waste generated or for recycling or reuse and comply the conditions specified in the authorization.	In Environmental Statements of three financial years, as per the account furnished, Hazardous Waste is higher than previous year.	Insufficient compliance of this provision. However, this conclusion may not hold if they have increased production and the same has led to an increment in waste generation.
Environment Protection Rules, 1986, Rule 3 provides for standards for emissions or discharge of environmental pollutants.	In all years, Environment Statements indicate that discharge and gaseous emissions has been less than the prescribed standard of the board.	This indicates compliance with this rule.
Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 Rule 4(6) requires that the occupier shall take all the steps while managing hazardous and other wastes to: provide persons working in the site with appropriate training, equipment and the information necessary to ensure their safety.	Zuari undertake educational programs spreading awareness regarding ammonia gas.	This implies they are at least complying in the "information" department.

It can thus be said that the company has been sufficiently complying with provisions relating to handling of hazardous substances, namely those under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016; Environment Protection Rules, 1986 and the EIA Notification, 2006. However, there has been an increase in hazardous waste generated over the years. For certain legal provisions, there was not adequate information available in the material available to reach a conclusion as to compliance. This was the case, for example, with Rule 18 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, which requires the occupier to provide the transporter with certain information.

Gujarat Narmada Valley Fertilizers and Chemicals Ltd (GNFC)

This is a coal-based captive cogeneration power plant with all its environmental compliance documents in place. Its final EIA report was furnished in compliance with the EIA Notification of 2006. As per the Report, the Company has undertaken proper precautions for storage and minimizing the risk of accidents. The Company has proper policies and procedures in place for ensure the effective implementation of Occupational Health, Safety and Environment Management Systems. A review is conducted by the members of the management every six months for assessing the effectiveness of the system and specifying corrective measures. The Company has a management organisational setup responsible for keeping a check on the implementation of the environmental management plan and policies. With respect to handling chemicals and hazardous substances the company complies with the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008; MSIHC (Manufacture, Storage and Import of Hazardous Chemicals) Rules, 1989, as amended in 2000; Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996; Explosives Act, 1884 and Rules, 2008; Gas Cylinder Rules, 2004; Motor Vehicles Act and the EIA Notification, 2006.

The proposed plant did not engage in the use of any major hazardous chemicals. As per the Report, the Company has already obtained an environmental clearance for the existing manufacturing units both from the MoEF and the Gujarat EIA Authority. It has also obtained the necessary licensing permissions with respect to the Factories Act, 1948; The Manufacture, Storage and Import of Hazardous Chemical rules, 1989, as amended to date; Hazardous and Other Waste (Management, Handling, Transboundary Movement) Rules, 2008; Explosives Act, 1884 and Rules, 2008; Gas Cylinder Rules, 2004; Motor Vehicles Act, 1989.

The Report⁷⁹ indicates that the company is committed towards the maintenance of proper records regarding hazardous waste generation, disposal and transportation, and compliance with the environmental Acts and Rules. The compliance reports

⁷⁹ Environment Clearance for expansion and addition in the existing unit at N.H.No.8, Notified Industrial Area, P.O. Narmadanagar – 392 015, Dist: Bharuch by M/s. Gujarat Narmada Valley Fertilizers Company Limited [GNFC] expansion and addition product in Category 5(f) of Schedule annexed with EIA Notification dated 14/9/2006, SEIAA GUJARAT, https://seiaa.gu jarat.gov.in/GNFC_EC.pdf.

have been made available for the years 2014,⁸⁰ 2019⁸¹ and 2018.⁸² As per the Reports, the conditions regarding the procedures to be adopted for treatment of effluents, the maintenance of records of the treatment of effluents and chemicals, and the requirement of submission of the same with the GPCB periodically are being complied with by the company. As per the Report, the company has complied with the other conditions laid down by the EIA Authority mandating the utilization of closed vessels to reduce gaseous emissions, the storage of flammable/toxic chemicals under negative pressure to minimize the risk of leakages, vigilance over the emissions in the work zone, etc.

- 1. **Hazardous Waste** The Company has complied with the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008. In addition, the company had obtained authorization from the GPCB for collection, storage, and treatment, etc. of hazardous waste, valid until 15th May 2015. The company is maintaining proper records for the hazardous waste generated, as per the HWM. Rules.
- 2. **Safety** The conditions laid down by the EIA Authority have been/are being complied with the company, which are as follows;
 - (a) The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 have been complied with, and the company has obtained the authorization necessary from the Government authorities;
 - (b) Factories Act and Rules are also complied with, which minimizes the risk of accidents involving hazardous or toxic chemicals;
 - (c) Conditions with respect to ventilation, installation of leak detection and repair system, storage of chemicals/hazardous substances, and exposure of workers to chemicals are well maintained along with a prepared Disaster Management Plan.

⁸⁰ Compliance Report of Environmental Grant 2014, GUJARAT NARMADA VALLEY FERTILIZER & CHEMICAL LIMITED (GNFC), https://www.gnfc.in/PDFandWORD/environmental_clearance-2014.pdf (last visited June 15, 2020).

⁸¹ *Compliance Report of Environmental Grant 2019*, GUJARAT NARMADA VALLEY FERTILIZER & CHEMICAL LIMITED (GNFC), https://www.gnfc.in/PDFandWORD/EC-Compliance.pdf (last visited June 15, 2020).

⁸² *Compliance Report of Environmental Grant 2018*, GUJARAT NARMADA VALLEY FERTILIZER & CHEMICAL LIMITED (GNFC), https://www.gnfc.in/PDFandWORD/Status-report-for-Compliance-of-ECdated-23rdMarch-2015-for-BAUP-&-other-projects17072018.pdf (last visited June 21, 2020).

3. As per the requirement under the EIA Notification, the decision of the EIA Authority providing EC to the project was notified in the public domain. The mandatory requirement of submission of bi-annual compliance reports with respect to environmental clearance has also been compiled with by the company. The conditions regarding the procedure to be adopted for treatment of effluents, maintenance of records of the treatment of effluents and chemicals, and the requirement of submission of the same with the GPCB periodically are to be complied by the company.

4. Summary of EC Compliance Reports for the Expansion of Brownfield Ammonia Urea Plant-

- a) There has been insufficient or sloppy compliance of required provisions. The company has, in its September 2015 and May 2016 reports, stated that emissions and particulate matter will be handled and will conform to guidelines of the Central and State Boards.
- b) Also, it will comply with the requirement of controlling fugitive emissions. "Will comply" also features in its compliance of MSIHC, 1989 Rules and Motor Vehicles Act, 1989. However, in these Reports, the Company did comply with authorization requirement. These shortcomings are also reflected in April, 2018 report.

5. Summary of EC Compliance Reports for the Ethyl Acetate Plant-

- a) Improvement in compliance can be seen over the years. But in certain reports, the company is using unsatisfactory or dubious terminology.
- b) As seen above, there is sufficient compliance with authorization and maintenance of records.
- c) An improvement was seen in compliance of HWM Rules, 2008. In June 2013, the Company averred that it will comply, but in later reports compliance was ensured.
- d) In June 2013, it said maintenance requirement of effluent treatment records will be complied. In later reports, it mentioned that the requirements are being complied by the company.
- e) In later reports, safety provisions had been/were being complied with.

Paints and Textile Sectors, and the Enforcement of Chemical Safety Norms

COMPANIES IN THE TEXTILE SECTOR

Vardhman Textile (Vardhman Group)

This Company has ensured compliance with the EPA Rules by handling the solid waste generated form treatment plants in the form of dry sludge, which neutralizes the toxic elements. It has also complied with the permissible limit prescribed by the SPCB/CPCB, and disposes off the hazardous solid wasted through facilities authorized by them.⁸³ All the statutory requirements with respect to hazardous wastes have been complied with. The solid waste, e-waste, spent oil, and ETP sludge are properly treated and disposed. Further, as per the information furnished by the Company, due compliance with the following laws and rules has been ensured through zero discharge of hazardous chemicals in the units:

- a) Factories Act, 1948;
- b) Environmental (Protection) Act 1986;
- c) Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016.

Applicable Laws	Company's Response	Inference
The Rule 4(1) of the Rules	As per the report, the company	The Company
Hazardous and Other Waste	has focused on it becoming a	complies with the
(Management and Handling)	zero discharge of hazardous	said rules.
Rules, 2016 obliges the occupier	chemicals unit.	
for the management of hazardous		
substances and other wastes, and		
for which the occupier shall ensure		
a proper prevention, minimization,		
reuse, recycling, and the safe		
disposal of hazardous waste.		

TABLE-8

⁸³ Hazardous and Other Waste (Management and Handling) Rules, 2016, Rule 6(2).

The HWM Rules mandate the	Hazardous solid wastes are	The company could
setting up of an on-site facility for	handled and disposed-off	be said to have
treatment, storage and disposal of	through facilities authorized by	complied with all
hazardous wastes for captive usage,	CPCB/SPCB, all the hazardous	the disposal pre-
and the same shall be governed by	waste generated is stored as	requisites, as The
the authorization provided in the	per the statutory requirements.	State and the Central
Rule 5.	Each unit has proper treatment	Pollution Board have
	facilities of e-waster, spent oil	played an important
	and ETP Sludge. The disposal of	role in the disposal
	which is carried through CPCB/	of the hazardous
	SPCB Recyclers.	wastes.
Section 23 of the Air (Prevention	The company emissions are	The company
and Control of Pollution) Act, 1981	very-well within the limits	complies with the Air
requires the industries to furnish	prescribed by the board.	Act, 1981.
information on the emissions in		
excess of the standards laid down by		
the Board.		

Arvind Mills Limited

The Company largely complies with the applicable laws regarding chemical safety, including the EIA Notification, 2006 and the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016. It also has followed the requirements of the Explosives Act, 1884 and undertaken frequent assessments to identify the environmental risks and takes preventive measures. It has framed safety, environment, chemical management and spill management policies. However, no evaluation of these policies and no independent audit to assess the same, have been reported.

Applicable Laws	Company's Response	Inference
Rule 13 of Environment	The chemical management policy of the	Sufficient
Protection Rules, 1986	company includes guidelines with respect	Compliance is
prohibits and restricts the	to chemical purchase, storage, disposal,	undertaken with
handling of hazardous	and Chemical Hazard Assessment on	the rules and laws
substances in different areas.	environment and human health. These	applicable.
	guidelines adhere to the mentioned rules.	

TABLE-9

Rule 4 of the HWM Rules, 2016 casts upon the occupier a responsibility for managing hazardous and other waste. The occupier has to take steps for, <i>inter alia</i> , safe disposal.	To ensure chemical safety and to minimize the hazards, the Company has taken the following steps- Limited the discharge of hazardous chemicals; encouraged the recovery of salts from wastewater, the substitution of hazardous chemicals from the chemical recipe, improvements in the production process to reduce consumption of chemicals, and reduction and elimination	Sufficient compliance is undertaken with the rules and laws applicable.
	parts of farms.	
Rule 4(5) of the HWM Rules, 2016, also, requires that the occupier shall take all adequate steps while handling hazardous wastes to: (i) contain contaminants and prevent accidents and limit their consequences on human beings and the environment; (ii) provide persons working on the site with the training, equipment and the information necessary to ensure their safety.	 For the purpose of chemical safety, the Company has undertaken initiatives under the Chemical Management: a. Providing Spill Kits for all departments to minimize the risk of hazardous chemical spills. b. Manual mixing and handling of chemicals has been replaced with auto-dosing. c. In order to reduce chemical exposure even at the end of the consumers, the Company has created easy wash fabrics. d. Developed technology has been adopted to reduce hard waste during spinning. e. The Company has adopted No-stone washing practice that helps in saving on chemicals and enzymes. 	The Company therefore, could be said to have a Comprehensive Chemical Management Policy for purchase, storage, usage and disposal in compliance with the regulations and standards.
Section 23 of the Air (Prevention and Control of Pollution) Act, 1981 requires the industries to furnish information on the emissions in excess of the standards laid down by the Board.	The Company emissions are very-well within the limits prescribed by the Board.	The Company could be said to comply with the Air Act, 1981.

Rule 68-U of Gujarat Factories	The company has upgraded the	The company
Rules, 1963	Occupational Health Centre to cater to	has sufficiently
	both minor as well as complex medical	complied with the
	needs. Periodic health checkups of	provision.
	employees are also conducted at the OHC.	

1. **Annual Reports-** Rule 14 of the Environment Protection Rules, 1986 casts a responsibility upon "any person carrying on an industry, operation or process requiring consent under Section 25 of the Water (Prevention and Control of Pollution) Act, 1974 or under Section 21 of the Air (Prevention and Control of Pollution) Act, 1981 or both or authorization under The Hazardous Wastes (Management and Handling) Rules, 1989 issued under the Environment (Protection) Act, 1986 (29 of 1986). Such a person must submit an environmental audit report for the financial year ending on 31st March, in Form V, to the concerned State Pollution Control Board. No such independent audit or evaluation of the policies has been carried out by the company.

COMPANIES IN THE PAINTS SECTOR

Asian Paints Limited

There has been a reduction in an industry's effluent generation and hazardous waste. Further, it has an Environment Health and Safety policy, which focuses on maintaining the highest operational standards for handling hazardous waste materials, curbing pollution, ensuring zero effluent generation and solid waste generation. The Company's secretarial audit reports mention its compliance with the Environment (Protection) Act, 1986, the Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016, and Manufacturing, Storage and import of Hazardous Chemicals Rules, 1989.

Applicable Laws	Company's Response	INFERENCE
Rule 4(1) of the Hazardous and Other Waste (Management and Handling) Rules, 2016 obliges the occupier to manage hazardous substances and other wastes, and for which the occupier shall ensure a proper prevention, minimization, reuse, recycling, and the safe disposal of hazardous waste.	The Company has adopted a behaviour based safety mechanism, a safety management system, and regular audits to assess the implementation of the safety standards.	The Company complies with the said rules.

TABLE- 10

Kansai Nerolac Paints Limited

The Company has mechanisms to dispose off the hazardous waste generated by the units in authorized treatment disposal facilities. Such waste includes distillation residue, ETP sludge, mixed paint and off specification paint. Further, no legal or show-cause notices issued by the SPCB/CPCB were left unresolved. These authorities, along with the State Industrial Development Centre and the MoEF, played a vital role in ensuring the utility of the treatment plant for the disposal of hazardous waste. The Company has implemented closed-loop manufacturing processes for better waste management and less exposure to work place hazards. Further, the hazardous waste generated is disposed off as per the statutory requirements and standards.

Applicable Laws	Company's Response	INFERENCE
As per the Rule 14 of the	The Company has not placed the	The Company is
Environment Protection Rules,	reports in the public domain after	not complying
1986, every occupier of a hazardous	2005-2011.	with the
substance needs to submit an		mentioned Rule.
environment report and publish it.		
Rule 4(1) of the Hazardous and	The Company has worked towards	The Company
Other Waste (Management and	reusing sample resin and cleaning	complies with the
Handling) Rules, 2016 obliges the	solvent in the manufacturing	said rule.
occupier to manage hazardous	process, to reduce the generation	
substances and other wastes, for	of distillation sludge. The	
which the occupier shall ensure the	Company has also reduced the	
proper prevention, minimization,	usage of hazardous materials,	
reuse, recycling, and the safe	and the flagship products of the	
disposal of hazardous waste.	decorative range of the Company	
	were produced using zero Volatile	
	Organic Compound Chemical.	

TABLE- 11

Section 23 of the Air (Prevention	As per the Report, there are no	The Company
and Control of Pollution) Act, 1981	legal or showcause notices received	complies with
requires the industries to furnish	from the CPCB/SPCB in the FY	the Air Act, 1981,
information on the emissions in	which were left unresolved.	and the SPCB and
excess of the standards laid down by		CPCB have played
the Board.		an important
		role in ensuring
		compliance.
The HWM Rules mandate the	In each unit of the Company,	The Company
setting up of an on-site emergency	Emergency preparedness and	complies with rule
plan under the Rule 13.	firefighting training are provided,	13.
	and there have been no major	
	accidents.	

Accidents Reported

- In 2006, a fire accident took place at a unit in Jainpur Industrial Area of Kanpur Dehat which led the unit being destroyed with an accompanying delay in fire tenders. Rules 13 and 14 of the Management, Storage and Import of Hazardous Chemical Rules, 1989 mandate proper on-site and off-site emergency plans. However, as the instant case suggests, there were no fire tenders available on site which defies the rules mentioned herein.
- In April, 2019 a fire broke out in the manufacturing unit of Asian Paints in Atchutapuram Special Economic Zone, Vizag which was reported to have happened due to mishandling of chemicals by untrained personnel. This mishandling led to explosions in 5 out of the 8 tanks in which chemicals were stored. Rule 4 of the Management, Storage and Import of Hazardous Chemical Rules, 1989 and Rule 4 of the Major Accident Hazards Control Rules, 1997 impose upon the occupier, a general responsibility to prevent such major accidents and to provide the persons working on-site with proper information, training and equipment. The Company hence failed to comply with the aforementioned Rules.

Observations

• A sound chemical waste management mechanism is required; however, as per reports analysed and reviewed, the companies have complied with the *basic* rules with respect to the disposal of the solid waste.

- The object of the primary legislation, i.e., *Hazardous and Other Waste* (*Management and Transboundary Rules*), *2016* is to recycle, reprocess and reuse hazardous waste through the setting up of Treatment Storage and Disposal Facilities (TDSFs). Environmental issues are of utmost importance and as a matter of fact, no company above has exhibited fool-proof TSDFs to handle the hazardous wastes.
- No independent audit for the regulation and compliance of environmental policies have been conducted against the mandate of *Rules10-12 of the Manufacture, Storage and import of Hazardous Chemical Rules, 1989,* thereby leaving the policy implementation to open ends. The research sample also suggests that a tonne of waste was generated by these industries. Therefore, the state has to ensure and devise appropriate regulations for the management, handling and disposal of the same. It is, however, the responsibility of the producer to ensure that damage to the environment is minimized, and to undertake measures which are in conformity with public health. These measures include adequate labelling (in cases of poisonous substances), containment, transport of the waste and the provision of an audit trail to follow the waste from its generation to treatment.
- Despite a number of legislations, rules, guidelines being in force, their enforcement is a major challenge. The probable causes of the same could be the lack of financial resources on part of companies, lack of awareness of these rules, and the lack of standardized protocols and enforcement mechanisms for the management of hazardous waste.

THE FAST-MOVING CONSUMER GOODS / HOUSEHOLD PRODUCT SECTOR

This section will look at goods which are consumed and used by households on an everyday basis, such as cleaning agents and rat-kills. Though used by common people, if misused, ingested or consumed physically, they may cause poisoning, even death.

GODREJ INDUSTRIES LIMITED-MOSQUITO REPELLENT SPRAYS AND TOOLS (BRAND: HIT)

	ANNUAL REPORTS		SUSTAINABILITY REPORT		WASTE REDUCTION
1.	The Company, in	1.	The Company has	1.	The Company has acknowledged
	addition to the solid		a Good and Green		the need for proper disposal and
	waste management		Program to regulate		treatment of wastes, and aimed at
	measures adopted		and monitor		zero waste disposal through landfills
	within the units,		environmental		by 2020.
	has also initiated		compliances and	2.	As per the report, there has been
	waste management		policies.		a reduction of 58% in specific
	operations in	2.	The Company		waste disposal through landfills as
	collaboration with		generates 1.3 Billion		compared to the fiscal year 2010-11.
	Hyderabad and		Tonnes of Solid waste	3.	The Company has started diverting
	Kalyan-Dombivali		per year in major urban		its waste from landfills to co-
	Municipal		cities.		processing units.
	Corporations.	3.	The Company	4.	The hazardous waste that is
2.	457 Million Tonnes of		generated 5,18,128 Kgs		generated which includes ETP
	Hazardous Waste was		of Hazardous Waste		Sludge, Spent Catalyst, Spent Oil,
	generated.		internationally.		Batteries, E-Waste and empty
3.	99.7% reduction in the				chemical containers, is dealt with
	waste generated per				in compliance with the Hazardous
	tonne of production.				and other Waste (Management
					and Transboundary Movement)
					Amendment Rules, 2016 and Plastic
					Waste Management Rules, 2016, in
					addition to the Rules laid down by
					the Pollution Control Boards.

TABLE- 12

4· 5· 6.	 10,000 Million Tonnes of waste is diverted per annum from landfills to community projects in India. More than 99% reduction in waste disposal through landfills. The Company as per the report has compiled with the 	4.	The Company generated 4,27,472 Kgs of Hazardous waste in India out of which 2,27,930 Kgs was recycled, 1,98,660 Kgs was incinerated and 882 Kgs was disposed through landfills. There has been a 27% reduction in specific energy consumption.	5. 6. 7. a)	The waste, including Hazardous waste, is disposed of through authorized vendors and channels as approved by the local government. Primary contributors of hazardous waste from the industry are Skimmed Oil from ETP and ETP Sludge. As per the statistics provided by the company, it generated the following waste in 2016-17- 336.19 Tonnes of Hazardous waste
a) b)	following legislations inter alia: Insecticide Act, 1968 and Rules Legal Metrology Act and Rules	6.	The products of the company in the household sector are approved under Toxicity Data, monitored for adverse effects on human health and also undergo scrutiny by regulators before approval.	b) 8.	in India. 327.81 Tonnes of Hazardous Waste internationally. 3,201.68 Tonnes of total waste, hazardous and non- hazardous was recycled in India, and 300.94 was destroyed by burning (incinerated).

RECKITT BENCKISER (LYSOL, HARPIC AND MORTEIN)

TABLE- 13

ANNUAL REPORT		SUSTAINABILITY REPORT		WASTE REDUCTION		
1.	In 2019, the Company reported a 37% reduction in waste generation per unit of production.	1.	The Company reported that 100% of its factories with zero waste disposal through landfills, for both hazardous and non-hazardous waste.	1.	The Company in 2019 reported a 27% reduction in waste per unit of production as compared to 2012.	
2.	In 2019, the Company recorded 96% hazardous and non-hazardous waste to landfill from its units.	2.	In 2017, as compared to 2012, the Company recorded a 21.4% reduction in waste production per unit of production.	2.	The Company in 2018 reported 96% of its manufacturing operations with zero waste to landfill.	

3.	The Company has adopted	3.	In 2017, the Company	3.	One of the challenges
	Global Waste Management		recorded a 16.9% per unit		faced by the Company
	Standards.		reduction of hazardous		is the high cost of
4.	The Company's health		waste.		alternatives to landfill.
	and safety standards are	4.	In 2017, there was a 31%	4.	The Company reported
	set up and audited by		reduction in CO ₂ emissions		the following figures in the
	the SQRC team, which		in the manufacturing		FY:
	is accountable to the		process.	2)	Total Waste Concreted-
	Corporate Responsibility		The Company eliminated	<i>a)</i>	or 881 Million Tonnes
	Sustainability, Ethics and	5.	the use of isoparabons from		95,001 Willion Tollies
	Compliance Committee.		its meduate and nestricted	b)	Recycled and Reused-
			its products and restricted		66,301 Million Tonnes-
5.	The Company complies		the use of propyl and		69%
	with the engineering		butyl parabens (chemical	-	
	standards in furtherance		substances) due to the health	To	tal waste disposed landfill
	of health and safety		risks posed by them.	in	Million Tonnes- 29,580.
	compliances.				

Accidents Pan-Sectorally and Legal Non-Compliance: A Critical Study into the Causes of the Accident

This part of the Chapter discusses and brings to light the accidents and incidents which have been reported across sectors, dissecting what transpired as a lack of legal compliance. Accidents that have occurred in the past 5 years have been taken up. Following the 1984 Bhopal gas disaster, the Ministry of Environment and Forest (MoEF) notified two sets of rules - Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 (hereinafter, MSIHC Rules, 1989) and Chemical Accidents (Emergency Planning, Preparedness, and Response) Rules, 1996 (hereinafter, CAEPPR, 1996). These were formulated to regulate the manufacturing, use, and handling of hazardous chemicals, and also provided for some emergency crisis management centers at different levels. Thereafter, the chemical accidents have reduced but have continued to occur, a few of which would be analysed in the section below-

FACT Leakage⁸⁴

What transpired- There was a minor ammonia leak at Fertilizers and Chemicals Travancore (FACT) factory. The incident happened on a Saturday afternoon, on January 27, 2018. Around 1 p.m., there was a heavy rush at Willingdon Island as people tried to evacuate. It happened at the factory premises while transferring ammonia to a tanker truck which had a faulty nozzle.

Seven people exposed to the gas were rushed to hospital. The situation could have been worse had it not happened on Saturday- a non-working day, when offices and schools were shut. The fire and rescue service and Kochi refinery's hazardous material emergency response vehicle, arrived shortly to control the situation.

Legal non-compliance leading to the accident:

- 1. The tanker truck to which ammonia was being transferred had a faulty nozzle. This runs afoul of several sections of Motor Vehicles Act, 1988 and Rules made thereunder. In particular, the responsibilities of respective parties under the Central Motor Vehicles Rules, 1989 were not complied with.
- 2. For example, Rule 129(1)(iv),⁸⁵ Central Motor Vehicles Rules, 1989 requires every owner of a goods carriage carrying dangerous or hazardous nature goods to equip it with safety equipment for preventing fire, explosion, or escape of hazardous or dangerous goods. In the instant case, the safety equipment (the nozzle), being faulty, could not prevent the escape of ammonia. This noncompliance was on account of the truck owner [however see point 4 below].
- 3. Rule 131,⁸⁶ Central Motor Vehicles Rules, 1989 talks about the responsibilities of the consignor for safe transport of dangerous or hazardous goods. Rule131(1) confers the responsibility on the consignor intending to transport any dangerous or hazardous goods listed in Table III to ensure certain things. This Table III lists ammonia as falling in the category of hazardous goods. Now, under sub-rule (1) (b), he is to ensure that vehicle is equipped with the necessary first-aid and safety equipment to contain any accident. In the instant case, the consignor- Fertilizers

⁸⁶ *Id.* Rule 131.



⁸⁴ Ammonia leak Creates Panic at Kochi's Willingdon Island, TIMES OF INDIA (June 27, 2018), http://timesofindia.indiatimes.com/articleshow/62671924.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst.

⁸⁵ Central Motor Vehicles Rules, 1989, Rule 129(i)(iv).

and Chemicals Travancore (FACT), did not ensure if the tanker had "necessary equipment".

- 4. Rule 131(2) requires the consignor to supply to the owner of the goods carriage, full and adequate information about the dangerous or hazardous goods being transported so as to enable such owner and its driver to comply with the Rules 129 to 137. In the absence of any information, it may be that FACT did not supply this information to the transporter and that is a potential cause of the non-compliance with Rule 129(1) (iv). However, no definite conclusion as such can be drawn. In fact, assuming that a nozzle is put in place in case of chemical transfers, contrarily it may be argued that since there was a nozzle, though faulty, the truck owner/driver was aware that some hazardous chemical was being transferred.
- 5. Further, Rule 132⁸⁷ provides for the responsibility of the transporter or owner of goods carriage. Under sub-rule (1), the owner has to ensure that the goods carriage has a valid registration to carry the dangerous or hazardous goods and the said carriage is safe for the transport of the said goods. Clearly, since the nozzle was faulty, it implies there was failure to ensure whether it was safe for transport.

Chennai's Manali Incident

In mid-May, 2020, a public sector urea manufacturing plant in Chennai's Manali witnessed an ammonia gas leakage. Locals who had gathered on nearby terraces suffered the effects of it. They substitute watery eyes and skin itching. As the Vizag horror was fresh in their minds, the residents gathered downstairs and panicked. The Secretary of the colony's Resident Welfare Association complained to the District Environmental Engineer. He reported that the people felt nauseated, breathless and had movement restrictions. Also, due to summer, locals had their windows open, putting them in danger. He stated that facemasks saved the day for them.

The stench subsided shortly. An official from Manali Zone-2 of the Greater Chennai Corporation confirmed the source of the leakage. Sources also reveal an inspection by the District Environment Engineer earlier on the day of the incident. Another official from Tamil Nadu Pollution Control Board pointed that the plant was shut on the previous day for maintenance reasons and this led to the minor leakage.

⁸⁷ Id. Rule 132.

Importantly, he added that the Company had been unable to identify the leakage and was unauthorized to release such a chemical in air.

Legal non-compliance leading to the accident

- 1. The leakage here had been of ammonia. Ammonia finds mention in all of the Schedules to the MSIHC Rules, 1989. This means that almost all provisions of the Rules shall apply to accident involving ammonia.
- 2. Rule 13 of the MSIHC Rules, 1989 requires the occupier to prepare and keep updated an On-site Emergency Plan. A key component of such a Plan is emergency mitigation measures. A key component of mitigation would be identification of leakage. The fact the company has not been able to identify leakage puts a question mark on their on-site emergency plan.
- 3. There has also been non-compliance of *Rule 4(2)*, MSIHC Rules, 1989. It requires that an occupier shall provide evidence to show that he has-

"(a) identified the major accident hazards; and

(b) taken adequate steps to-

(i) prevent such major accidents and to limit their consequences to persons and the environment; ..."

- 4. Rule 15(1), MSIHC Rules, 1989 requires the occupier to take appropriate steps to inform persons outside the site either directly or through District Emergency Authority who are likely to be in an area which may be affected by a major disaster about-
 - (a) The nature of the major industrial accident; and
 - (b) The protection measures and the "Do's" and "Don'ts" which should be adopted in the happening of a major disaster.

It appears that people outside were not aware of the safety measures and the do's and don'ts to be taken. Therefore, noncompliance with this rule can be inferred. The same would also run counter to several provisions of the Factories Act, 1948, which require the spread of information to the outside public.

Fire Incident, Waghodia GIDC⁸⁸

On June 20, 2020 a major fire gutted an agrochemical company in Waghodiya GIDC. Officials said that the fire began at around 5 in the morning in the Company's solvent plant. Approximately 30% of the staff present in the packaging unit were timely evacuated.

Firemen from Emergency Response Centre (ERC), Darjipura responded first. Because of major blasts in the solvent plant, however, a major call was announced. Consequently, around seven vehicles from Vadodara Fire and Emergency Services and two water bowsers from neighboring industries were called. An ERC's fire officer mentioned that the solvent plant alone consumed thousands of liters of water and foam liquid. As the fire had also spread to packaging and other areas, it took them till noon to extinguish it. The officer has surmised faulty electric connections to be the cause of incident. He points out that the water was taken from nearby companies; the company did not have the basic equipment, hydrant systems and water, to douse afire.

Legal non-compliance leading to the accident:

- 1. Rule 13 of the MSIHC Rules, 1989 requires the occupier to prepare and keep update an on-site emergency plan. An on-site emergency can be, among other reasons, due to fire. Schedule 11 to the Rules requires details of fire fighting capabilities to be provided in the On-site Emergency Plan. Since the Company did not have basic fire fighting equipment such as a hydrant system and water, there was no adequate On-site Emergency Plan with suitable fire-fighting equipment.
- 2. Section 41B (2) of The Factories Act, 1948, in part, requires the occupier to lay down a detailed policy with respect to the health and safety of the workers employed therein. A detailed policy, even if formulated, was not proper and/or implemented, given that even the basic firefighting equipment was absent.
- 3. Section 38 of the Factories Act, 1948 calls for precautions in case of fire. It requires that all practicable measures to prevent the outbreak and spread of fire are to be taken. Further, the necessary equipment and facilities for extinguishing

⁸⁸ Agrochemical factory gutted in Waghodiya GIDC, TIMES OF INDIA (June 21, 2020), https://timesofindia. indiatimes.com/city/vadodara/agrochemical-factory-gutted-in-waghod iyagidc/articleshow/76486819. cms#:~:text=Vadodara%3A%20A%20major%20fire%20broke,were%20all%20evacuated%20in%20 time.

fire are to be provided and maintained. Since the fire spread to packaging and other areas and it took till noon to extinguish it, clearly, the measures to prevent spread was not put in place. Also, it is believed that there were faulty electric connections. This would mean that practicable measures to prevent the outbreak were not present. Further, no necessary equipment and facilities for extinguishing the fire were present on site.

The L.G Polymer Gas Leak, Vizag (May 2020)⁸⁹

Styrene monomer was being utilized at the plant to deliver expandable plastics. The capacity prerequisite of styrene monomer is that it ought to be put away carefully, at a temperature below 17 degrees Celsius. There was an impermanent fractional shutdown of the plant due to Covid-19 lockdown, barring upkeep exercises in the plant, which were being completed according to a pre-decided timetable. The issue started because of styrene gas not being put away at the proper temperature. This caused weight to develop in the capacity chamber and drove the valve to break, bringing about the gas spillage. Additionally, the compartment that was being utilized to store styrene gas was old and not appropriately kept up. The gas was put away in two tanks with an absolute limit of 5 metric tons. This non-support of the office brought about the spillage of 3 tons of styrene into the encompassing zones. Another one of the prominent issues is the low and unmaintained nature of the plant premises and the tanks, etc. The accident killed nearly 12 people.

Legal non-compliance leading to accident-

The accident involves many legislative enforcement gaps, a few among which are discussed. The plant did not have any environmental clearance by any competent authority, which is a pre-requisite under *Clause 2* of the Environmental Impact Assessment (EIA) Notification, 2006.⁹⁰ However, the Company had a state permit to continue the operation and had been operating without any prior permission from the Andhra Pradesh Pollution Control Board (APPCB) for the past two decades.

⁸⁹ Andhra Pradesh Bureau, Visakhapatnam gas leak | Updates,THE HINDU (May 07, 2020), https:// www.thehindu.com/news/cities/Visakhapatnam/visakhapatnam-lg-polimers-chemical-plant-gas-leakupdates-may-7-2020/article31523178.ece?homepage=true

⁹⁰ The EIA Notification was issued in pursuance of and in accordance with the objectives of National Environment Policy. It vociferously mandates the "new projects or activities" and the "expansion or the modernization of existing projects or activities entailing capacity addition with change in process and or technology", being undertaken in any part of India, to obtain a 'prior' environmental clearance.

- 1. The incident reported also stands in the violation of the rules mentioned in the Notification S.O. 1533(E), which was issued under the *Sub Rule (3) of the Rule 5 of the Environmental (Protection) Rules, 1986* for imposing certain restrictions and prohibition on the establishment of new/ expansion of existing projects and activities. These Rules are imposed based on the projects' potential environmental impacts, as indicated in the Schedule to the notification, on projects being undertaken in any part of India, unless prior environmental clearance has been accorded in agreement with the objectives of National Environment Policy and the method specified in the notification, by the Central Government or the State or Union territory Level Environment Impact Assessment Authority (SEIAA), to be constituted by the Central Government.
- 2. No system was there to prevent and monitor the amount of dissolved oxygen in the vapour space. As a result, the level of oxygen went below 6%, and led to self-polymerization. Further, there was no on-site emergency plan, which is in turn not in consonance with the *Rule 13* of the MSIHC Rules, 1989 obliging the Central Pollution Control Board or State Pollution Control Board [or Committee] under Environment (Protection) Act, 1986, as the case may be,⁹¹ to take preventive measure and construe the emergency plans. Also, the tank from which vapour leaked was an old one, and the upper and middle parts of which did not have a temperature monitoring apparatus.⁹²
- 3. If the order⁹³ of NGT invoked *Absolute Liability* for the loss of life in the gas leak which was a result of the lack of experience of LG Polymer and the Korean principal in the monitoring and maintaining of safety and environmental standards. Section 8 read along with Sub-section (1) of Section 3 of the Public Liability Insurance Act, 1991, providing for compensation for the loss of life in

⁹¹ MSIHC (Amendment) Rules, 2000, Rule 13(i).

⁹² OECD guidelines ascribe upon the management a duty to "Utilize "inherently safer technology" principles in designing and operating hazardous installations. This should help reduce the likelihood of accidents and minimize the consequences of accidents that occur. For example, installations should take into account the following, to the extent that they would reduce risks: minimizing to the extent practicable the quantity of hazardous substances used; replacing hazardous substances with less hazardous ones; reducing operating pressures and/or temperatures; improving inventory control; and using simpler processes. This could be complemented by the use of back-up systems."

⁹³ In Re: Gas Leak at LG Polymers Chemical Plant in RR Venkatapuram Village Visakhapatnam in Andhra Pradesh, O.A. No. 73/2020, p.29 https://greentribunal.gov.in/orderpdf/orderlist.pdf.

case of accidents⁹⁴ caused by the mishandling of Hazardous substances, may be invoked in the instant case. However, as a repercussion, the Indian Police arrested 12 officials from the company LG Polymers, including the South Korean Chief Executive. The charges which were invoked are of culpable homicide, and negligent handling of hazardous chemical substances.⁹⁵

The above discussed accidents were a few with the most casualties and damage to the nature and to property. However, the above discussed incidents are not exhaustive as there have been many industrial accidents in the recent past in India owing to the negligence and the lack of safety measures to be taken while *storing* the gases in a secured manner. India has been a country where the lessons are learnt mostly after a series of accidents and incidents happen. In this sector however, the accidents which have happened have been due to the lack of upkeep of the premises, leading to leakages and the negligence in the proper storage of the chemicals.

CONCLUSION

India must definitely consider implementing the tried and tested best practices followed by countries around the world in regard to the implementation of hazardous chemical laws. Some suggestions that the author believes that India may be able to incorporate, based on the best practices discussed in this segment, include but are not limited to:

- a) Ensuring there is regular inspection and monitoring of industries and factories in order to guarantee compliance with existing rules and regulations (United States of America)
- b) Considering the possibility of criminalizing the assembly and sale of rinse off personal care products containing plastic micro beads (Scotland)
- c) Creating tax incentives to promote recycling practices (Thailand)

⁹⁴ The Public Liability Insurance Act, 1991, § 2(a) ("accident" means an accident involving a fortuitous, sudden or unintentional occurrence while handling any hazardous substance resulting in continuous, intermittent or repeated exposure to death, of or injury to, any person or damage to any property but does not include an accident by reason only of war or radio-activity); *See also* Chemical Accidents (Emergency Planning, Preparedness, And Response) Rules, 1996, Rule 2(a).

⁹⁵ Environment Protection Rules, 1986, Rule 13; The Factories Act, 1948, § 41(C); Hazardous and Other Waste (Management and Handling) Rules, 1989, Rule 4.

Hazardous chemical safety and regulation of poisonous substances are not isolated domestic issues anywhere in the world. Each country relies on international guidelines, and drafts domestic rules and regulations to set legal benchmarks. However, significant lessons are drawn from the practical incidents that happen in the sector when an accident, incident or disaster occurs. Such incidents specifically pinpoint the direction in which the gap exists. In the entirety of this Chapter, through the analysis of the law in place and coinciding it with the accidents that have taken place, the focus has been on identifying the gaps which exist in the enforcement of the existing laws. While it would be unfair to state that the existing regulations are insufficient, we can say with surety that it is the understanding, enforcement and implementation of these laws and regulations, in a unified and harmonious manner, which is of concern. It is eventually left to the superior courts to decide on the interpretation of regulations and the setting up of enforcement directives that this sector chooses to operate on.

The Municipal administration must work harmoniously with the state and central governments by keeping the infrastructure in place and acting expressly when the need arises. In the LG Polymer case, it is patent that an accident was imminent when the chemical facility was left as it is with a lack-lustre responsibility of people to anticipate that the storage and upkeep of such potentially dangerous substances would lead to an accident. Similarly, in the cylinder blasts in Maharashtra, the cylinders were too close to the source, leading to numerous explosions which injured and caused the death of people on the plant. This is a red flag which is being raised in this Chapter.

Secondly, the regulations on chemical and poison safety are scattered across various laws and rules. Intra-sectorally, the regulations overlap and cause ambiguity regarding the exact person liable. With goods being used on an everyday basis within the households, specific guidelines clearly demarcating and ensuring safety of use should be promulgated and the victim should not have to spend their lives trying to affix liability on the responsible person in Court. In rural places, there are no means to discover how many people have died or injured themselves using unsafe off-thecounter products, which were incorrectly marked or were kept in reach of children who ingest these substances and fall ill. The procedures to deal with the consequences of
the accident are found to be rather sluggish, while all the focus remains on perfecting the preventive laws and regulations.

While Disaster Management is largely carried on-site, it is the emergency preparedness and accident reporting which is not enforced in all its vigor. The industries and the companies which have been studied in this Chapter, being the largest manufacturers in their respective areas, seem to have all their disaster management plans and reports in place, with a zero-percent case of any incident happening on their facilities. It is, however, the smaller facilities which get involved in avoidable accidents. Some gap continues to exist in the maintenance of the reports with the NDMA and the local authorities. Updated information about the number of accidents and the steps so taken to mitigate the occurrence are not maintained in a uniform manner. That could benefit from some positive criticism, and it may be hoped that the legislature and the government of India shall in course of time, ensure a water-tight enforcement mechanism.

CHAPTER 6

Role of Committees Constituted by the Judiciary in the Management of Hazardous Waste in India

INTRODUCTION

The role of the Indian Judiciary in the management of hazardous wastes and the scope of judicial interpretation in this field over the years have expanded remarkably. The Indian Courts, in various instances, have used the tool of a 'continuing mandamus' in environmental matters for ensuring the implementation of their orders and sought frequent reports from governmental agencies to monitor their progress with respect to Court orders. The Supreme Court, in specific, has been very proactive in this respect: for its efforts in the realisation of environmental justice in the past, it has earned the monikers of "Garbage Supervisor" and "Lords of the Green Bench."¹ The Court has, through various judgments, expanded the scope of Article 21, interpreting the right to life and personal liberty to include the right to pollution-free and wholesome environment.² Many High Courts have also recognized this expanded interpretation of Article 21. For example, the High Court of Andhra Pradesh in T. Damodhar Rao v. S.O. Municipal Corporation,³ High Court of Himachal Pradesh in Kinkri Devi v. State of HP,⁴ High Court of Rajasthan in L.K. Koolwal v. State of Rajasthan,⁵ and the Kerala High Court in Madhvi v. Tikaram⁶ have held that the degradation of environment violates the fundamental right to life.

For protecting the environment from solid and hazardous waste, the judiciary has relied on principles such as the public trust doctrine, precautionary principle, polluter pays principle, and the doctrine of strict and absolute liability; awarded exemplary

¹ S.S. Prakash & P.V.N. Sarma, *Environment Protection vis-a-vis Judicial Activism*, 2 Supreme Court Journal 56 (1998).

² Dehradun v. State of Uttar Pradesh, AIR 1985 SC 652.

³ T. Damodhar Rao v. S.O. Municipal Corporation, AIR 1987 AP 171.

⁴ Kinkri Devi v. State of HP, AIR 1988 HP 4.

⁵ L.K. Koolwal v. State of Rajasthan, AIR 1988 Raj. 2 at 4.

⁶ Madhvi v. Tikaram, (1988) Kerala Law Times 73 at 731.

damages to safeguard the environment; and also applied the principle of intergenerational equity in addition to the existing law of the land. Various orders of the Court over the years bear testimony to the active role played by the judiciary in the management of hazardous waste throughout the country. The adjudication in this field has benefited from the recommendations and findings of fact-finding commissions and expert committees that the Supreme Court has established under Article 32 of the Constitution. The Court's proactive intervention in the management of hazardous wastes started in 1995 with the case of *Research Foundation for Science, Technology and National Resource Policy* v. *Union of India & Others.*⁷ Throughout the period of the pendency of this case, the Court passed various orders and constituted many committees to ensure adequate redressal of the issue of hazardous waste.

The National Green Tribunal, constituted under the National Green Tribunal Act, 2010 has also played a vital role in the management of hazardous waste. Although the 2010 Act does not explicitly empower the NGT to initiate *suo motu* action, it has expanded its powers to take *suo motu* cognizance of some cases⁸ for environmental protection and public welfare. Even before the issue of monitoring hazardous waste management was referred to the tribunal by the Supreme Court, it was already dealing with various matters related to the management of disposal of hazardous waste.⁹

This Chapter explores the working of the four Committees established by the Supreme Court and the National Green Tribunal for monitoring the disposal and management of hazardous waste in the country. These are, namely, the High Powered Committee (HPC), the Supreme Court Monitoring Committee (SCMC), the Technical Experts Committee (TEC), and the Monitoring Committee et al. The orders and recommendations of the Committees have been studied in detail and examined through a critical lens. The Chapter presents some of the main findings of the Committees on the implementation of the hazardous and waste management rules promulgated in the country. The Chapter also discusses the findings in different

⁹ Rajiv Narayan & Anr. v. Union of India & Ors., Unreported Judgements, Original Application No. 804 of 2017 (SC).



⁷ Research Foundation for Science, Technology and Nature Resource Policy v. Union of India & Ors, Unreported Judgements, IA No. 63 of 2012 (SC).

⁸ For example, *In re*: Gas Leak at LG Polymers Chemical Plant in RR Venkatapuram Village, Visakhapatnam in Andhra Pradesh, Review Application No. 19/2020; Court On Its Own Motion vs State Of HP Ors., CWPIL No.15 of 2010 (The NGT dealt with increased vehicular traffic in Himachal Pradesh); Tribunal At Its Own Motion vs Ministry Of Environment, Original Application No. 16/2013 (The NGT dealt with mining in Tiger Reserve Forest in Kanha National Park).

reports regarding the role played by the different departments and Ministries involved in the management of hazardous substances and waste in the country.

Research Foundation for Science, Technology and National Resource Policy v. Union of India & Others¹⁰

A writ petition¹¹ was filed by the Research Foundation for Science, Technology and Natural Resource Policy, through its Director, Vandana Shiva, when it was realised that India had become a dumping ground for hazardous wastes, which was causing irreparable harm to the environment and people. The case, in essence, involved the scrapping and dismantling of ships, the import of waste oil into India and dumping of hazardous wastes. The petition was filed under Article 32 of the Indian Constitution on the ground that Article 14 and 21 of the Constitution were infringed. To support this claim, reliance was placed upon the Basel Convention, of which India became a signatory on 15th March 1990 and ratified on 24th June 1992.

The Court aimed at identifying and examining the problem of hazardous waste, the extent of toxic waste in India, the availability of waste disposal sites, other related matters that could help in the minimization of the generation of such waste, and its proper handling as well as disposal to ensure the safety of the environment and human life. Numerous affidavits were filed by the Ministry of Environment and Forests (hereinafter referred as MOEF) and Pollution Control Boards before the Court. The Court understood the seriousness of the issue at hand and the extent to which the hazardous waste was being generated. Therefore, it issued notices to all the State and Central governments and the State Pollution Control Boards. Further, it directed that the ship-breaking operations should take place only under strict and proper regulations.

HIGH POWERED COMMITTEE

The Supreme Court observed that the HW Rules had been amended twice during the course of the proceedings - on June 06, 2000 and May 23, 2003. However, even after these amendments, there was no implementation of the Rules. The Court further acknowledged that various affidavits that had been submitted on behalf of the MOEF,

¹⁰ Decided on 14 October, 2003.

¹¹ Writ Petition No. 657 of 1995 with SLP (C) No. 16175 of 1997 and CA No. 7660 of 1997 decided on 14 October, 2003.

Central Pollution Control Board (CPCB) and others showed that the authorities lacked basic information on the magnitude of the problem and the extent of toxic and hazardous wastes. Moreover, the State governments had not presented before the Court all the material facts even though ample time was provided to them.

Therefore, the Court felt the necessity of constituting an appropriate authority to examine the matter and, by its order dated 13th October, 1997, constituted a High Powered Committee (HPC) under the chairmanship of Prof. MGK Menon. The primary function of the Committee was to examine all the matters related to hazardous waste in detail based on 14 terms of reference, and report and recommend on the same.¹²

The High Powered Committee consisted of twelve experts from different disciplines and fields, namely¹³: Dr. Claude Alvares, expert in scientific aspects of environmental damage and their impacts on society, legal aspects, Basel Convention, accountability to the public; Dr. D.B. Boralkar, expert in chemistry, pollution control, Basel Convention, with experience at CPCB and SPCB in enforcement of regulations; Dr. Mrs. Indrani Chandrasekharan, expert in chemistry, formulation of legislation, Basel Convention, with experience at MOEF; Dr. A.K. Saxena, expert in environmental engineering, experience at National Productivity Council on hazardous waste management projects, particularly landfill technology; Shri Paritosh Tyagi, expert in pollution control, institutional mechanisms with experience as a former Chairman, CPCB; Dr. R.R. Khan, Director Ministry of Environment and Forests & Member-Secretary; Dr. T.S.R. Prasad Rao, Director, Indian Institute of Petroleum, Dehradun amongst others.

The High-Powered Committee submitted its report on April 20, 1998. Its report and recommendations have been summarized in the table below:

¹² Research Foundation for Science, Technology and National Resource Policy v. Union of India & Others, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order date 14.10.2003 (SC).

¹³ Id.

Issue	Recommendations/Findings of the HPC
Processing of	The HPC noted two activities which, in its view, posed a bigger problem than
Indigenous	import of hazardous substances:
Toxic Wastes	• The processing of indigenous toxic wastes like waste oil and lead and the
	industrial process resulting in their generation;
	• The process of their disposal by way of incineration and their subsequent
	dumping in landfills.
	Moreover, the HPC noted that inadequate efforts were made by the MOEF to
	implement the HW Rules, 1989. ¹⁴
Roles and	The HPC recommended that there be coordination between the MOEF, as the
Respon-	focal point in the Central Government for matters relating to environment, and
sibilities of	the other ministries, given the latter's crucial roles in protecting the environment.
MOEF in the	For instance, the Ministry of Finance was responsible when imported hazardous
management	Figure Ministry The HPC observed that there was inadequate communication
of hazardous	between different Departments and Ministries. Moreover, there was an imbalance
waste	between the number of available administrative and scientific posts, coupled with
	the problem of shortage of scientific staff in the Ministry. The meager expenditure
	by the Hazardous Substance Management Division of the MOEF reflected poorly
	on the Ministry's efforts. Four officers in the entire country were assigned the
	task of monitoring the implementation of HW Rules, along with performing their
	additional responsibilities. This resulted in dependency over MOEF in coming up
	with legislations and rules and strict adherence to formalities, which in turn lead
	The HPC recommended the following responsibilities and roles for the MOEF:
	1. Proper coordination between the various Ministries.
	2. Awareness building for society and stakeholders on environmental issues.
	3. Ensuring research on the scientific and technological aspects of
	4. Focusing on environmental issues of the country in the international
	forums.
	5. Making use of the large number of technical capabilities present within
	the country.
	6. Strengthening of the Hazardous Substance Management Division.
	The HPC recommended that the MOEF's role should not only be confined to
	issuing rules and guidelines that are generally not implemented. It suggested a
	variety of tasks that the MOEF could perform – be it ensuring waste minimization
	or a reduction in the utilisation of toxics or environment-friendly recycling and
	disposal of wastes. ¹⁵

TABLE - 1

¹⁴ *Id*.

¹⁵ Id.

Role of the	The HPC averred that the role of the State Pollution Control Boards was to
CPCB and	provide authorization only to hazardous waste units with adequate treatment and
SPCBs	waste disposal facilities. The CPCB was directed to ensure that the licensing of
	industries that produce products banned under Indian laws should be prevented,
	as banning the import of hazardous wastes would not be enough. ¹⁶
Dumping of	The HPC observed that the contamination of groundwater is attributable to
Hazardous	the open dumping of hazardous wastes. This had also resulted in drought-like
Waste	situations in areas that previously had plenty of water. In this context, the lack
	of policy and vision at the highest level had made the management system very
	weak. ¹⁷
Licensing of	The HPC recommended that licenses not be provided to those industries
Industries	which were involved in the production of products prohibited under Indian
	laws. According to the HPC, only bans on the import of hazardous wastes was
	not enough and these industries also needed to be restricted from producing
	hazardous substances. ¹⁸
Role of the	The HPC recommended the following to ensure maximum public participation:
public	1. Appointment of local residents as wardens for environmental surveillance
	to take note of illegal dumping of hazardous and toxic waste.
	2. Providing access of the records of environment protection authorities to
	the general public.
	3. Informing the public about the amount of hazardous wastes generated,
	hazardous chemicals being used, etc., through media sources like notice
	boards, newspapers, radio, television and the internet.
	4. Providing adequate protection and confidentiality to the informers and
	whistle-blowers' within various industries.
	5. Conducting third-party audits of hazardous wastes regularly, with the audit teams including local residents. ¹⁹
Ship-	For this activity, the HPC recommended the constitution of an Inter-Ministerial
Breaking	Committee which would include the Ministry of Surface Transport, Ministry
	of Steel, Ministry of Labour, Ministry of Environment, other environment and
	labour organisations, and the representatives of ship-breaking industries. It was
	suggested to be conducted by taking safety precautions and keeping in view the
	precautionary principles and guidelines of the CPCB. ²⁰

The Court accepted the recommendations of the HPC. It noted that there had been a lack of implementation of the HW Rules, and directed the MOEF to create a

16 *Id*.

17 Id.

18 *Id*.

19 *Id*.

20 Id.

mechanism to take action against those responsible for the non-implementation of the directions of the Court and the Ministry. The Court directed the Central Pollution Control Board and the State Pollution Control Boards to ensure that the latest technologies for hazardous waste management are used to minimize the adverse effect on the environment. The State Pollution Control Boards were asked to present comprehensive reports before the Court regarding the illegal hazardous dump sites present in their jurisdictions. Further, they were directed to formulate financial plans that estimated the cost of immediate measures for preventing further damage to the environment.

The Court directed the SPCBs to prepare toxic inventories, stating the amounts of hazardous wastes generated. Such an inventory was directed to be verified by the CPCB and filed before the Court. Also, a national inventory for toxic wastes was directed to be prepared by CPCB for the purpose of rehabilitating hazardous waste dump sites. The information regarding these inventories had to be made available to the public through various means of mass communication. The Court also gave directions for bank guarantees, and empowered the CPCB to monitor the import of hazardous waste for a period of two years. The CPCB was directed to consider the suggestions of the HPC regarding the non-licensing of the various recommendations of the HPC, and also create a policy document relating to hazardous waste management. The Court further provided a schedule that included a time-frame for taking various actions in furtherance of the Court's directions.

The primary reason for the constitution of the HPC was to conduct a detailed examination of all the issues relating to the hazardous waste, including its generation, its import and its disposal. The HPC's report covered an array of issues, and served as a major guide for the management of such toxic waste. It also led to the constitution of the Supreme Court Monitoring Committee on Hazardous Waste Management in 2003 for monitoring the execution of the SC's order.

Although the HPC analysed a broad spectrum of issues regarding hazardous wastes in its report, it did not provide elaborate state-specific information about the industries generating HW, unlike the SCMC or the Monitoring Committee of the NGT.

SUPREME COURT MONITORING COMMITTEE (SCMC)

The Supreme Court, by its order dated 14.10.2003 in the case of *Research Foundation for Science, Technology and National Resource Policy* v. *Union of India*,²¹ constituted a Supreme Court Monitoring Committee (SCMC) on Hazardous Waste Management. The Committee consisted of: (a) the existing members of the Standing Committee previously constituted by the MOEF to advise it on hazardous waste management issues²² and (b) two other experts, Dr. Claude Alvares and Dr. DB Boralkar. Its primary function was to ensure that the decisions of the Court regarding hazardous waste management and other related issues are timely implemented. Also, it had to ensure that all the aspects to which the MOEF had agreed to, by its affidavit dated September 13, 2003, during the proceedings in *Research Foundation for Science, Technology and National Resource Policy* v. *Union of India*,²³ were enforced and implemented in letter and spirit and without any delays. The Court directed the SCMC to file quarterly reports, and the Committee was also directed to advise the Ministry on issues regarding hazardous waste and other incidental issues.

The Supreme Court Monitoring Committee comprised of the following members:²⁴

- 1. Dr. G. Theyagarajan, Senior Secretary, COSTED, Chennai (Chairman);
- 2. Dr. V. Rajagopalan, CPCB Member (Chairman);
- 3. Director, NEERI, Nagpur (Member);
- 4. Director, IIP, Dehradun (Member);
- 5. Director, NCL, Pune (Member);
- 6. Dr. NH Hosabettu, Director, HSH Dir, MOEF (Member-Secretary);
- 7. Director, IICT (Co-Opted Member);
- 8. Dr. Claude Alvares, NGO;
- 9. Dr. DB Boralkar.

²¹ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order dated 14.10.2003 (SC).

²² Id.

²³ Id.

²⁴ Id.

¹⁶⁸

ORDERS PASSED BY THE SUPREME COURT MONITORING COMMITTEE

During the course of its operation, the Supreme Court Monitoring Committee has played a very important role in regulating the generation and management of hazardous wastes, and in reporting to the Apex Court on the implementation of regulatory standards and Court decisions. If the areas of intervention of the SCMC were to be enlisted, three pertinent areas can be identified–

- (a) the functioning of industrial units generating hazardous waste, primarily in the Western and Southern states;
- (b) waste oil containers docked at different ports of the country;
- (c) beaching of ships and ship-breaking activities.

The orders, observations and recommendations of the Supreme Court Management Committee have been discussed under three heads, each depicting one of the three areas identified.

SCMC'S SUPERVISORY ROLE IN THE WORKING OF INDUSTRIAL UNITS

This table presents the roles, recommendations and observations of the SCMC vis-avis industrial units, in a chronological order.

Date and Site of Visit	Observation, Directions and Recommendations of SCMC
May, 2004	The SCMC carried out an inspection in the industrial units.
Site of Visit: Industrial	The SCMC'S Second Quarterly Report (February, 2004 – April,
units in Ankleshwar, Vapi	2004) stated that inadequate enforcement by the authorities
and Vadodara in Gujarat	contributed to the dumping of hazardous wastes, leading to
and Union Carbide Plant in	groundwater contamination and scarcity in drinking water
Bhopal (M.P.) in pursuance of	supply in those places. The Court directed both the states to
the order dated 14 th October	ensure clean water, and the release of water through overhead in
2003 in W.P. 657/1995	the villages affected by the toxic wastes. ²⁵

TABLE - 2

²⁵ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil)No. 657 of 1995, Order dated 07.05.2004 (SC).

June/July, 2004 Site: Industrial Units in Delhi, in pursuance of the order dated 14 th October 2003 in W.P. 657/1995	The SCMC visited the industrial units in the Anand Parbat Area, to discover that the industries were involved in activities like metal casting. ²⁶		
	Observations	 Wastes were mainly dumped in the drains due to inadequate facilities relating to the handling, storage and disposal of hazardous wastes.²⁷ For example, untreated effluents were discharged in the drains in absence of Common Effluent Treatment Plant (CETP) facility in the Anand Parbat Area. In Najafgarh, the hazardous wastes from the drain were discharged in the Yamuna river.²⁸ However, in Wazirpur Industrial Area, the wastes were discharged in drains inspite of having a CETP facility.²⁹ Many industries lacked authorisation under the HW Rules. Inaction with respect to the Supreme Court Order³⁰ by not displaying information 	
		on Board regarding its involvement with hazardous chemicals and wastes.	
		• Utilisation of an illegal dump yard to dump hazardous wastes from the industry.	
		• The inadequate functioning of the CETP in about 17000 industries was attributed to the non-payment of dues for their maintenance and construction.	
		• A non-functional Hindustan Insecticide Plant was found in the area.	
		• There has been a contempt of the order of the Supreme Court by the Delhi PCC, since it had permitted unauthorized units to continue functioning.	

²⁶ SCMC visit to Delh*i*, Toxics Link, http://toxicslink.org/docs/SCMC_Visit_Delhi.doc (last visited Dec. 20, 2020).

²⁷ Id.

²⁸ Id.

²⁹ Id.

³⁰ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil)No. 657 of 1995 (SC).

Directions	Directions of the SCMC to the
	industries
	• Unauthorised industries were directed to get authorization by May 31, 2004 by the SCMC, failing which contempt action would be initiated.
	• The SCMC directed the CETPs to be brought in line with the rules and regulations by 6 th July, 2004. The SCMC had to be informed of this compliance by 7 th July, 2004. It directed the imposition of a fine of Rs 10 lakh INR on the CETPs for discharging untreated effluents in drains.
	• The maintenance dues of CETPs were directed to be paid by 31 st August 2004, failing which the SCMC would initiate proceedings against concerned parties.
	Directions of the SCMC to PCC
	• The SCMC directed the PCC to set up display boards as required as per Supreme Court Order ³¹ with the assistance of NGOs, at least in Hindi, and with minimum expenditure.
	• The SCMC directed the PCC to acquire the site of illegal dumping from the individual concerned on the ground of misuse. The wastes were directed to be covered with polythene sheets within 7 days for transfer to a safer place.
	• The PCC was directed to ensure the closure of all the defaulting unauthorised units within 24 hours of these recommendations.
	• The SCMC directed the PCC to collect samples of the drain's water in Wazirpur Industrial Area.

	Recommendations	 The SCMC recommended that the funds in the nature of fines, received from defaulting units and states, be deposited in a fund called as the National Ecology Restoration Fund, after approaching the Apex Court. The SCMC recommended the creation of a landfill under CPCB regulations in the Hindustan Insecticides Ltd (a PSU)'s non-functional plot.³² 	
September, 2004 Site: Industrial Units at Tamil Nadu,in pursuance of the order dated 14 th October 2003 in W.P. 657/1995	The SCMC visited Tamil Nadu between 20 th and 22 nd September 2004, to examine the implementation of the directions given by the Supreme Court by its order dated 14.10.2003, ³³ and verify the report that the Pollution Control Board of Tamil Nadu had submitted to it. Thereafter, the SCMC made certain observations and passed directions. ³⁴		
	Observations	 The SCMC visited the Hindustan Lever Ltd.(HLL) in Kodaikanal (Thermometer factory) and observed that the thermometer unit of the Hindustan Lever Ltd. was involved in releasing toxic mercury into the natural environment. The SCMC, after its visit to M/s Sterlite Industries Ltd, Tuticorin, observed that the unit lacked adequate infrastructure and facilities for managing the hazardous waste produced by it. The industry was involved in disposing off and dumping large amounts of arsenic, which contained slag. The factory was also involved in emitting sulphur dioxide in excess of the permissible standards. The SCMC found that Southern Petrochemical Industries Corporation, Tuticorin, which was a non-functional industry, had several hundred tonnes of hazardous wastes that had not been disposed off since the time that the industry was last in operation i.e. before 1988. 	

³² Id.

³³ Id.

³⁴ Report of the visit of the SCMC to Tamil Nadu from September 20-22, 2004, SIPCOT AREA COMMUNITY ENVIRONMENTAL MONITORS, http://www.sipcotcuddalore.com/scmc_visit_tamilnadu_092004.html (last visited Dec. 20, 2020).

	 In pursuance of the Supreme Court Order dated 14th October, 2003, a presentation was made by the Chairperson of the TNPCB to the SCMC, detailing the actions taken by it according to the orders of the Supreme Court and SCMC directions. The SCMC stressed on the necessity of a field visit in the States to get a real view of the generation of hazardous wastes by the industries.³⁵ The SCMC learnt that the team could not visit the TDSF site owing to public opposition towards its construction. Therefore, it granted a hearing to the persons and the NGOs who opposed the construction, and gave directions to the TNPCB and the State Government. The SCMC was informed that though it was compulsory, the industries were not providing information regarding their units to the citizens and the NGOs.
Directions	 The TNPCB was directed to make HLL liable to pay restoration costs under the polluter pays principle. It furthermore directed the HLL to build new health clinics and non-polluting enterprises as a social rehabilitation package. The constitution of a Local Area Environment Committee (LAEC) was mandated for the TNPCB, for monitoring the execution of the orders.³⁶ With respect to Tamil Nadu Chromates and Chemicals, Ranipet, Vellore, the SCMC did not visit the site but directed the TNPCB to submit in writing: a) Whether any survey of the people affected by the contamination of ground water due to the dumping of toxic waste had been conducted or not ? b) If conducted, a register of affected facilities should be produced to the SCMC for further action
	 action. c) Further, the TNPCB was directed to collect costs from the parties involved in dumping of the hazardous waste. The factory would not be allowed to reopen for business, as before.³⁷

- 36 Id.
- 37 Id.

	• The SCMC directed the Sterlite Industries authorities to conduct an environmental audit of the industry and assess its environmental management practices. ³⁸ The company was required to make its pollution control data available online. ³⁹
	Other directions of SCMC to the TNPCB ⁴⁰
	• Momentarily put on hold the construction of the TSDF at Melakottaiyur and, in the mean-time, dispose off the hazardous wastes routed there to common disposal sites within Gumidipoondi industrial estate or nearby. The SCMC also directed the resumption of the TSDF construction after the public regained confidence.
	• Facilitate the establishment of common hazardous waste disposal facilities in the state.
	• To take responsibility to ensure that all industrial infrastructure development corporations establish CETPs, in collaboration with SIPCOT and the Department of Environment.
	\bullet To ensure that the Karur disposal facility was completed by the $28^{\rm th}$ February 2005.
	• During the public hearing, the SCMC learnt about the presence of volatile organic compounds (VOC) in the SIPCOT area, which had affected the health of the residents. The SCMC hence directed the TNPCB to investigate this matter, and asked the CPCB to lay down standards for organic VOCs. It also directed the reversal of air pollution in Cuddalore within 3 months, failing which would invite closure of the industries. ⁴¹
	• The SCMC found the data furnished by the TNPCB regarding the number of CETPs in the State as inadequate in terms of the performance of the units, treatment systems installed and characteristics of the final treated waste. Therefore, it directed the TNPCB to report the adequate data within ten days. ⁴²

- 38 Id.
- 39 Id.
- 40 *Id*.
- 41 *Id.*42 *Id.*
 - 10

		The SCMC directed the TNPCB to maintain a register recording information regarding consent/authorization issued under the Water Act/Air Act/HW Rules, keeping it open for inspection, and making the copy available on request ⁴³	
		Directions of the SCMC to the State Government	
		• Complete the approval process for Tiruppur site within 10 days of the receipt of the report, and make the site operational by 30 th January 2005.	
		• Divide the cost of common hazardous waste disposal equally between the industry and the government.	
October, 2004	The SCMC visited Hema C	hemicals in Gujarat to find that the industry	
Site: Hema Chemicals, Gujarat, in the pursuance of the Order of the Supreme Court dated 14 th October, 2003, W.P. 657/1995	was involved in illegal dumping of hazardous wastes. An affidavit was submitted to the Supreme Court by a sub-committee of the SCMC in March 2004, which stated that the waste dumped by Hema Chemicals was equivalent to the toxic waste lying inside the Union Carbide Plant in Bhopal. Understanding the seriousness of keeping such amount of hazardous waste in the middle of the city, the SCMC asked the Court to interfere. ⁴⁴		
	Directions	 Directed Hema Chemical authorities to clean the hazardous waste (hexavalent chromium) dumped by it, and directed the unit to pay a compensatory cost of Rs. 17 crore under the Polluter Pays Principle.⁴⁵ Directions to the government To set up an expert body for the purpose of making a rehabilitation plan for the area. To not permit the owner of the chemical unit to leave the country or dispose off his assets till the rehabilitation was completed.⁴⁶ 	

46 Id.

⁴³ Id.

⁴⁴ *Good Shot*, Indian Environment Portal, http://www.indiaenvironmentportal.org.in/content/41723/good-shot/ (last visited Dec. 20, 2020).

⁴⁵ Id.

October, 2004 Site: Industrial Units in Kerala in the pursuance of the Order of the Supreme Court dated 14 th October 2003	Observations	• The SCMC was assured by the managing director of the Kerala State Industrial Development Corporation (KSIDC) that a permanent setup for management and disposal of hazardous waste would be built by 15 th March. These actions were the outcome of the 190 blanket orders that were passed against the companies by the Kerala PCB for closure of theiroperations in August, 2004. However, the State Government pleaded for a 3-month extension, keeping in view the gravity of the situation, and for an extension of 6 months for constructing the treatment storage disposal facility (TSDF). The SCMC accepted the request of the government. ⁴⁷
	Directions	 The SCMC ordered 22 Kerala firms, including State-run Travancore Titanium Ltd., to be closed for theirfailure to adhere to the norms within 24 hours of the visit. 168 other companies, who had responded to the notices of Kerala PCB, were inspected and if found to be in violation of norms, were served closure notice within 24 hours.⁴⁸ The 168 firms stated that they had taken primary measures and were being issued a deadline of 15th March, 2005 to set up permanent measures. However, the other 22 companies had a deadline of 24 hours only. If any discrepancies were found in the primary measures undertaken by the 168 firms, an immediate closure notice would follow.⁴⁹

Quarterly Report of SCMC submitted in November, 2004

The SCMC, in its Report, made many observations, recommendations and directions after its visit to different units all over India. It was noted that the implementation of orders of the Supreme Court was unsatisfactory. The following observations and directions were made by the committee in its Report⁵⁰:

⁴⁷ Polluting companies to face music as deadline nears, FINANCIAL EXPRESS (October 14, 2004), https://www.financialexpress.com/archive/polluting-companies-to-face-music-as-deadline-nears/99539/.

⁴⁸ Id.

⁴⁹ Id.

⁵⁰ Frederic Noronham, *India's Supreme Court Panel cracks down on Hazardous Waste*, ENS-Newswire (November 19, 2004), http://www.ens-newswire.com/ens/nov2004/2004-11-19-01.html.

- 1. 75 factory units in western India were directed to be shut down on account of discharging acidic and untreated waste, leading to contamination of groundwater.
- 2. The SCMC asked the Supreme Court to direct the supply of fresh water through pipelines in the villages of Gujarat and Madhya Pradesh, where the water was polluted with toxic effluents. Thereafter, the committee directed the industrial majorsin Kerala, such as Hindustan Coca-Cola, Binani Zinc, Kerala Mines & Minerals etc., to supply clean water to villages havingcontaminated water.
- 3. The SCMC commenced actions to return the hazardous wastes to their countries of origin after it discovered that such wastes were being imported in the country, in breach of Supreme Court orders.⁵¹

In January 2004, the SCMC held a meeting with the chairpersons and member secretaries of the PCBs of 5 states - Maharashtra, Gujarat, Karnataka, Tamil Nadu, and Andhra Pradesh- which allegedly contributed to more than 80% of India's hazardous wastes. Other states' PCBs were directed to report on the measures taken by them to implement the directions of the Supreme Court. The following were the directions given by the SCMC to various states and their PCBs⁵²:

- a) **DELHI:** The Delhi PCB was directed to ensure the closure of all the unauthorised but functional hazardous waste generating units in first week of July. It was reported that 957 industries were closed for a month, and were reopened only after obtaining authorization.
- b) **KERALA:** The closure of 195 industries was ordered in Kerala.
- c) **MAHARASHTRA:** It was noted that 75 factories in the Tarapur city discharged acidic and untreated waste in open spaces. The closure of these units was directed within 24 hours, and they were permitted to be reopened only after depositing a bank guarantee of Rs. 25,000. The guarantee would be forfeited in case the pH fell below 5 again. The SCMC ordered the delivery of the waste in secure landfills, which would be constructed by using the funds deposited by Tarapur Industries Association. It also warned the industry to deposit the payment for building a common effluent treatment plant, failing which the Committee would direct the closure of the entire industrial area.

⁵¹ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreprted Judements, Writ Petition (Civil)No. 657 of 1995 (SC).

⁵² Noronham, *supra* note 50.

- d) **GUJARAT:** Hema Chemicals had dumped 77,000 tons of toxic waste in the city. The SCMC directed the survey of the contamination caused, and the cost to be imposed for the remediation and disposal of the waste.
- e) **GOA:** Zuari Industries, which discharged untreated toxic waste, was directed to combine it with cement and entomb it carefully in the unit's premises. Further, the SCMC levied a fine on the industry for its earlier inaction regarding the management of waste.

The SCMC also examined issues such as the non-functioning of common effluent treatment plants in Delhi, Gujarat, Maharashtra and Delhi. It gave time to the plants to comply with the Indian environment protection laws. It got hazardous waste dumps emptied from Gujarat, Maharashtra and West Bengal.⁵³ It also acknowledged the issue of Daman Ganga River pollution. It further noted its intention to examine the contamination of Patancheru-Bollaram and other similarly contaminated areas polluted by arsenic, mercury and chromium wastes, so that it could suggest solutions for the rehabilitation of the affected groundwater aquifers.⁵⁴

Relying on the Supreme Court judgment,⁵⁵ the SCMC established Local Environment Committees consisting of Pollution Control Board officials, representatives of the industries, and NGOs. These local committees were required to examine the execution of court orders, and re-establish the trust of the people in implementation of the same.⁵⁶

In pursuance of the Quarterly Reports of the SCMC, the Supreme Court passed numerous orders with respect to the waste oil containers lying at various ports, and on the issue of beaching and ship-breaking. The orders of the Court are discussed below under two-heads- orders with respect to waste oil containers and orders with respect to beaching and ship-breaking. The directions that were made by the SCMC regarding beaching and ship-breaking are also discussed.

⁵³ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil)No. 657 of 1995 (SC).

⁵⁴ Id.

⁵⁵ Id.

⁵⁶ Id.

ORDERS OF THE SUPREME COURT AND SCMC'S ROLE WITH RESPECT TO THE WASTE OIL CONTAINERS LYING AT THE NHAVA SHEVA PORT

The SCMC visited the Nhava Sheva Port, Navi Mumbai in March 2004, to discover that 15 importers had illegally imported 133 containers of waste oil in the disguise of importing lubricating oil. The Court acknowledged the submission of SCMC's first Quarterly Report (October 2003 to January 2004), and passed orders to deal with the issue of the waste oil containers lying in the Port. The Court directed the SCMC to deal with the re-export of the waste oil containers, and the Commissioner of Customs to retain the samples of the consignment. A document had to be submitted to the SCMC mentioning that the original exporter had received the consignment, if re-export was undertaken. The Court further directed that any further testing of consignments to be done by the Commissioner of Customs, in consultation with SCMC.

Order of the Supreme Court dated $5^{\rm th}$ January 2005

The Supreme Court directed the following:

- The incineration of the consignments in incinerators having adequate facilities, under the supervision of the SCMC, where the cost of incineration was to be borne by the importers by depositing the amount within four weeks with the SCMC;
- It directed the SCMC to ensure that the demolition of the oil containers takes place in a timely fashion;
- The submission of a compliance report by the SCMC;⁵⁷
- That the Jawaharalal Nehru Port Trust, Mumbai Port Trust, and the Commissioner of Customs provide information to the SCMC including the details of the import of the 170 containers of toxic waste which were lying unclaimed in those places. After receiving the information, the SCMC was directed to submit a report consisting of its recommendations on the issue of the unclaimed consignment.⁵⁸



⁵⁷ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Write Petition (Civil) No. 657 of 1995, Order dated 05.01.2005 (SC).

⁵⁸ Id.

• The option of recycling the consignment of Eleven Star Esscon, if exercised by the government, should be exercised under the supervision of the SCMC. If a request for recycling was not received within four weeks, the consignment would be incinerated like others.⁵⁹

Order of the Supreme Court dated 9th May, 2005

In May 2005, the Supreme Court noted that the Fifth Quarterly Report filed by the SCMC identified the issue that the 133 containers of waste oil were still lying at Nhava Sheva Port, and had not been incinerated in spite of the previous Court order.⁶⁰ The Court observed that the reason for such inaction was the non-payment of incineration cost by the importers. The Court noted that none of the Jawahar Lal Nehru Port Trust, the Mumbai Port Trust, or the Commissioner of Customs Department had filed the required information with the Court within 4 weeks, as per the previous directions of the Court.⁶¹ Therefore, the Court again directed the following:

- The immediate destruction of waste oil under the supervision of the SCMC.
- The Customs Department was to incur the expenses for the present incineration, and the importers were provided the last opportunity to deposit the incineration cost within 14 days. Failing this, the importers would have to answer a show-cause regarding why contempt proceedings should not begin against them before the Court on 18th July, 2005.⁶²
- The SCMC was to file a report regarding the factum of incineration of the consignment and its payment made by the importers, if any. Further, it was directed to hand over the empty containers left post-incineration to the Customs Department.⁶³
- The authorities of the Jawahar Lal Nehru Port Trust, Mumbai Port Trust, and the Commissioner of Customs Department were mandated to file personal affidavits mentioning the reasons for the non-compliance with the Court's order, and provide information to the SCMC as required.⁶⁴

⁵⁹ Id.

⁶⁰ *Id*.

⁶¹ *Id.*

⁶² Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order dated 09.05.2005 (SC).

⁶³ Id.

⁶⁴ Id.

Order of the Supreme Court dated 18th July, 2005

In July 2005, the Court directed that the payments for incineration of the 133 containers⁶⁵ be made through a Bank Draft, in favour of the Commission of Customs, Jawaharlal Nehru Port Trust, Nhava Sheva.⁶⁶

Through an affidavit, the Chief Commissioner of Customs submitted before the Court the record of consignments of hazardous waste for which the importers had not filed bills. The details were also shared with the SCMC. Furthermore, it was contended before SCMC that the consignments had been misdeclared to evade import trade control provisions. Thereafter, the Court ordered the confiscation of such consignments. It also observed that about 209 consignments were imported in 1992. The Chief Commissioner of Customs was directed to file an affidavit within two weeks stating the reasons for the inaction on the consignments for such a long period of time, and the details of the proceedings to be undertaken in case such inaction was the result of any officer's dereliction.

Order of the Supreme Court dated 16th January, 2006

In January 2006, the Supreme Court directed the importers of the 133 containers to get them incinerated. The importers pleaded for an extension to make the payment, which the Court granted, till the next date of hearing. The Customs Authorities were directed to submit their stand in the matter prior to the next hearing.⁶⁷ The Court stated that the hearing for the matter relating to the ships entering the maritime boundary was scheduled before the SCMC on January 20, 2006. The parties also asked for a direction to the effect that the ships not be permitted to enter the 'Economic Zone' till the next hearing.⁶⁸

68 Id.

⁶⁵ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order dated 05.01.2005 (SC).

⁶⁶ Id.

⁶⁷ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order dated 16.01.2006 (SC).

ORDERS OF THE SUPREME COURT AND THE SCMC'S ROLE WITH RESPECT TO BEACHING AND SHIP-BREAKING

A. In June 2005, the Court passed orders with respect to a Danish ship, which was allegedly carrying hazardous wastes and was beached at the ship-breaking yard in Alang in Gujarat. This was in pursuance of the observations made by the SCMC. Although the Denmark government had cautioned that the ship was carrying hazardous waste, government authorities permitted the ship to be docked at Alang. The Danish authorities had ordered the ship to be in Denmark till it had been decontaminated of all hazardous waste, but the ship had escaped. Thereafter, the Denmark government requested the Indian authorities to send the ship back to Denmark. However, an examination carried out by an Indian inspection team denied any existence of hazardous substance onboard and gave it a clean chit.⁶⁹

The SCMC directed that the ship be sent out of India. It held that the advent of the ship itself was a breach of the ship-breaking directives of the Apex Court.⁷⁰

- B. In August 2005, the SCMC reversed its earlier stand and gave new recommendations to the State authorities on the issue of the above mentioned Danish Ship. The SCMC now allowed both beaching and dismantling under the supervision of Gujarat PCB. In its previous stand, the SCMC had directed the Gujarat Maritime Board and Gujarat PCB to drive out the ship, inspite of the fact that the government agencies had already given it a clean chit.⁷¹
- C. Through an order dated 12th May 2006, the Court directed the SCMC to scrutinise the issue relating to the Ship-Breaking Unit in Alang, Gujarat, and then submit a report. It also held that the SCMC was at liberty to take the views of the government bodies involved (the Gujarat PCB and Gujarat Maritime Board), if deemed necessary.⁷²

⁶⁹ Id.

⁷⁰ Danish fugitive banished, INDIAN ENVIRONMENT PORTAL (June 29, 2005), http://www.indiaenvironment portal.org.in/content/29269/danish-fugitive-banished/.

⁷¹ Ungainly Volte Face, Indian Environment Portal (August 30, 2005), http://www.indiaenvironmentportal. org.in/content/43518/ungainly-volte-face/.

⁷² Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order dated 12.05.2006 (SC).

D. Through its order dated 5th June, 2006, the Supreme Court passed some directions on the basis of the SCMC's recommendations regarding the anchorage, beaching and dismantling of the ships. It held that the conditions that are stipulated by the SCMC seemed reasonable. Therefore, the Court directed action along the lines of those recommendations. It further directed that no action that is taken will confer any equity on ship owners whose ships were being sought for beaching, anchorage or dismantling.⁷³

ANALYSIS OF THE WORKING OF THE SCMC

Keeping in mind the polluter pays principle, the SCMC, after its constitution, visited many states and Union Territories to analyse the situation of hazardous wastes, and passed numerous orders. The directions therein included the closure of certain unauthorised industries, the levy of fines on others, and the conduction of rehabilitation programmes. In September 2006, it also suggested the recirculation of the guidelines by CPCB. It also directed the CPCB to ensure that these guidelines were implemented by SPCBs and PCCs while granting authorization to units generating hazardous waste. Guidelines for the following were laid down: (i) Transportation of hazardous waste (ii) Upkeep of disposal sites (iii) Check list for issuance of authorization by SPCBs/PCCs.⁷⁴

Claude Alvares, a member of the Committee during the three years of its existence, agreed that the Committee's monitoring has resulted in a reduction of the import of plastic and non-ferrous metallic wastes. This proves the importance of the SCMC's role in the management of hazardous waste in the country.⁷⁵ The SCMC had carried out many praiseworthy initiatives, such as the constitution of local area environmental committees. Subsequently, these initiatives were overtaken by PCBs and the MOEF&CC.

⁷³ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order dated 05.06.2006 (SC).

⁷⁴ *Hazardous Waste Management*, http://164.100.107.13/Highlights/2006/HAZARDOUSWASTE MANAGEMEN1[1].pdf (last visted Dec. 20, 2020).

⁷⁵ Akshai Jain & Padmaparna Ghosh, *Got hazardous waste? Send it to India*,LIVEMINT (Apr. 25, 2010), https://www.livemint.com/Home-Page/dt8qhhMrkRUYLJbkbf8noM/Got-hazardous-waste-Send-it-to-India.html.

While the role played by the SCMC in the regulation of hazardous waste generation is indeed laudable, there have been a few issues that the SCMC has failed to remedy, some of which have been highlighted hereunder:

SCMCs failure to ensure adequate number of waste disposal facilities across states

A major reason for the illegal dumping of hazardous wastes is the lack of proper and adequate disposal facilities. While this was pointed out by the SCMC in several states, and it had even directed some states to construct disposal facilities, it was not successful in ensuring the construction of adequate number of facilities. The inadequacy of the disposal facilities will subsequently be discussed under two heads-Deficit of TSFDs with respect to Land Disposable HW, and Deficit in Incineration Capabilities and HW generation of states.

The Deficit of TSFDs with respect to Land Disposable HW

To understand the deficit in capacity of the TSDFs vis–à–vis the Land Disposable hazardous wastes in India, it is important to examine the data provided by the "National Inventory of HW Generating Industry and HW Management in India" in 2009. According to the 2009 inventory, Gujarat contributed to the maximum amount of land-fillable wastes in India, followed by Maharashtra.⁷⁶ The following table presents the data from the Report. It clearly shows that active HW generating states such as Maharashtra, Gujarat, Tamil Nadu, and Rajasthan still showed a deficit in capacity in the TSDFs to dispose off the generated waste even in 2009, i.e., after the SCMC had ceased functioning. The SCMC did not make many recommendations or initiate many actions to increase the TSDFs in the states, contributing to the maintenance of this deficit.

⁷⁶ National Inventory of HW generating Industry and HW Management in India in 2009, CENTRAL POLLUTIONCONTROL BOARD, https://cpcb.nic.in/displaypdf.php?id=aHdtZC9OZXdJdGVtXzEoNV9od19pbn ZlbnRvcnlfZmluYWxfcmVwb3JOXzIwMDkucGRm (last visited Dec. 20, 2020).

TABLE – 3: Table showing TSDF Capabilities vis-à-vis the generation of HW in India, as taken from National Inventory of HW Generating Industry and HW Management in India (2009)⁷⁷

State	Total Capacity of TSDFs in TPA	Land Disposable Hazardous Wastes in India	Deficit/Surplus in Capacity
Gujarat	447401	1107128	-(659727) (Deficit)
Maharashtra	250000	568135	-(318135) (Deficit)
Tamil Nadu	100000	157909	-(57909) (Deficit)
Rajasthan	20000	165107	-(145107) (Deficit)
Himachal Pradesh	50000	35519	14481 (Surplus)
Madhya Pradesh	90000	34945	55055 (Surplus)

The Deficit in Incineration Capabilities vis-à-vis HW Generation of states

Data from the above mentioned inventory also provides insights regarding the deficit in incineration capacity across states. Clearly, there was a deficit in the capacity of the incinerators considering the incinerable HW generated by the states of Maharashtra and West Bengal, even in 2009. According to 2009 inventory, Maharashtra is the largest contributor of incinerable wastes in India (36.75%contribution) followed by Gujarat (26.12% contribution). West Bengal is the seventh largest contributor of incinerable hazardous waste in India (3.03% contribution).⁷⁸ The SCMC did not take enough steps to remedy the deficit in the capacity of the incinerable HW in these states which contribute to the maximum incinerable HW.

⁷⁷ Id.

⁷⁸ Id.

TABLE – 4: Table showing the total capacity of incinerators vis-à- vis total incinerable HW generation in the state, as per the National Inventory of HW generating Industry and HW Management in India (2009)⁷⁹

State	No. of Common Hazardous Waste Incinerators	Total Capacity of the HW Incinerators (in MTP)	Total incinerable HW generation in the State (in MTP)	Surplus/ Deficit
Maharashtra	2	30000	152791	-(122791) (Deficit)
West Bengal	1	10800	12583	-1783 (Deficit)
Gujarat	4	161297	108622	52675 (Surplus)

Inability of SCMC to ensure the implementation of the Supreme Court orders directing the SPCBs to provide HW generation data to CPCBs

As per the orders of the Supreme Court, a national inventory of toxic hazardous wastes was to be created by the CPCB, which would provide data regarding HW generating states and other incidental issues. Although the SCMC directed the SPCBs to furnish data relating to HW waste generation, it could not successfully enforce the same. There are many SPCBs that have not provided the relevant data even till 2009, well after the SCMC ceased functioning. As the following table shows, Gujarat, Tamil Nadu, and Delhi did not provide any data regarding the number of HW units that had been granted authorisation, and whether authorisation was under process even in 2009. As per the available data, all the HW generating industries in Maharashtra had been granted authorisation as per the 2009 data. On the other hand, the SPCB of Andhra Pradesh had not provided the CPCB with any data at all.

TABLE – 5: Table showing the status of the SPCBs' provision of data relating to HW in the state concerned, according to the National Inventory of HW generating Industry and HW Management in India (2009)⁸⁰

State	No. of HW Generating units	No. of HW units applied for Authorization	No. of HW units for Which Authorization granted	No. of HW units for Which Authorization is under process
Gujarat	7751	No information provided by SPCB	No information provided by SPCB	No information provided by SPCB
Maharashtra	4909	No information provided by SPCB	4909	No information provided by SPCB
Tamil Nadu	2532	No information provided by SPCB	No information provided by SPCB	No information provided by SPCB
Delhi	1995	No information provided by SPCB	No information provided by SPCB	No information provided by SPCB
Andhra Pradesh	No information provided by SPCB	No information provided by SPCB	No information provided by SPCB	No information provided by SPCB

Failure to provide conclusive reports on the matter of the Ship-Breaking of the Clemenceau

The SCMC failed to provide a conclusive report on the matter of the ship-breaking of the French Ship Clemenceau, which was carrying HW. Afterwards, the matter was handed over to the Technical Expert Committee.

Failure of SCMC in Tami Nadu

Environment activists have questioned the Committee's actions in Tamil Nadu. On the SCMC's directions, the NEERI and the Tamil Nadu PCB initiated the construction of a landfill at Gumudipoondi, a village that is rich in fresh water and has a shallow water table. Although the Madras HC ordered a stay on the construction of the said landfill, it was realised that an SCMC order could not be revoked. Moreover, the SCMC garnered some disrepute for approving the hazardous wastes producing Sterlite Industries' plant at Tuticorin.⁸¹

⁸⁰ Id.

⁸¹ *Id.*

TECHNICAL EXPERTS COMMITTEE

The issue of ships containing hazardous substances entering the territorial limits of India, and ship-breaking, came to light during the pendency of the proceedings in *Research Foundation for Science, Technology and National Resource Policy* v. *Union of India*.⁸² A French ship named Clemenceau, carrying hazardous waste, arrived in India in early 2006. However, it was called back to France. This resolved any immediate controversy that could have resulted in relation to the arrival of the ship. However, the Court observed that this was a persistent problem. It deemed it appropriate to examine the infrastructural stability and sufficiency of the ship-breaking yard at Alang, Gujarat to verify whether it was operating in an eco-friendly manner.⁸³

To that end, a Technical Experts Committee (TEC) was formed by the MOEF, in pursuance of the recommendation of the Supreme Court. It was constituted to examine the sufficiency of the present infrastructure of the Alang ship-breaking yard. In some ways, the Technical Experts Committee carried on the task initiated by the Supreme Court Monitoring Committee. It was also mandated to indicate deficiencies in, and recommend measures for the upgradation of the infrastructural facilities concerned.⁸⁴

The TEC consisted of (a) experts from reputed institutions, such as the National Institute of Occupational Health (NIOH), Ahmedabad, and the Indian Toxicological Research Centre (ITRC), Lucknow; (b) retired Naval Officers; (c) academicians from Indian Institutes of Technology (IITs)-Kharagpur and Chennai; and representatives of the Central Pollution Control Board (CPCB).⁸⁵ It was directed to submit its report within a period of eight weeks, which was extended from time to time. The MOEF was required to bear the expenses of the operation of the TEC.⁸⁶

⁸² Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil)No. 657 of 1995, Order dated 17.02.2006 (SC).

⁸³ Id.

⁸⁴ Id.

⁸⁵ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition(Civil)No. 657 of 1995, Order dated 06.09.2007 (SC).

⁸⁶ Id.

CATEGORIZATION OF THE SHIPS OF SPECIAL CONCERN BY THE TEC ⁸⁷

The TEC identified 6 categories of ships which proved to be toxic and could pose serious concerns to the environment, especially owing to the hazardous substances used by them or that could be generated during their dismantling or breakage. The TEC also specified the infrastructural facilities essential for ship-breaking depending on the category of the ship concerned, the steps to be taken to avoid the spillage of hazardous substances and hazardous waste, and the authorities responsible for regulation of the activity.

Category	Directions issued by TEC		
	Hazardous Substances	Large quantities of Polychlorinated Biphenyls (PCBs), Asbestos-containing Materials (ACMs).	
Warships	Essential Infrastructure	Sufficient infrastructural facilities at the yard to manage identified quantities and for disposal of wastes in the vicinity, in addition to the availability of trained staff.	
	Monitoring Authority	Stringent monitoring by SPCB/SMB.	
Large Passenger Liners	Hazardous Substances	Large quantities of PCBs and ACMs.	
	Essential Infrastructure	Sufficient infrastructural facilities at the yard to manage the identified quantities and for disposal of the wastes in the vicinity. This was required in addition to availability of trained staff.	
	Monitoring Authority	Stringent monitoring by SPCB/SMB.	
	Hazardous Substance	Residual Radiation Level.	
Nuclear Powered Ships	Essential Infrastructure	Scrutiny of the residual radiation level by AERB/ Health, Physics Department of BARC, and the implementation of their suggestions for decontamination, if found above the permissible limits.	
	Monitoring Activity	Removal of radioactive wastes, reactors and cores by the owner prior to the last voyage for breaking.	

TABLE - 6

Deep Draft Ships that are needed to be beached at 1.5 k.m. or more from the shore base line	Monitoring Activity	The transfer of the hazardous substances or the things containing hazardous substances while taking added precautions, so that spillage in the sea can be avoided.	
IMDG	Hazardous Substance	Hazardous Residues in Cargo Tanks	
	Essential Infrastructure	Sufficient infrastructural facilities at the yard to manage the identified quantities and for disposal of the wastes in the vicinity. This was required in addition to the availability of trained staff.	
	Monitoring Authority	Stringent monitoring by SPCB/SMB	
EDSO/Offshore	The problem faced	Difficulties in beaching	
Platforms	Monitoring Activity	The transfer of the hazardous substances or the things containing the hazardous substances, so that spillage in the sea can be avoided	

RECOMMENDATIONS OF THE TEC REGARDING THE ANCHORING, BEACHING AND BREAKING OF THE SHIPS

With respect to the anchoring, beaching, breaking of ships, the TEC gave certain specific recommendations, which were accepted and affirmed by the Supreme Court with further directions. The following table summarises the recommendations of the TEC.

Process	Recommendations		
Anchoring of the Ship	Ship owners or recyclers were asked to submit certain documents prior to the ship's arrival, for a desk review to be conducted by the State Maritime Board (SMB) in consultation with SPCB and the Customs Department. The documents would, <i>inter alia</i> , include the name of the ship, ⁸⁸ the name of the Master of the Ship and their nationality, and the assessment of hazardous wastes/hazardous substances. The permission to allow the anchorage of the ship would depend on the decision of the SMB/SPCB/Customs Department, based on the desk review. If the permission for anchorage is granted, the SMB would issue some instructions with regard to safe anchorage. ⁸⁹		
Beaching of the Ship	The recycler was required to submit the documents mentioned in Annexure-I of the Gujarat Maritime Board (GMB) notification dated 5 th July, 2003, which included a gas free and fit for hot working certificate(for oil tankers).These would be verified by the representatives of the Customs Dept./SPCB/Explosives Dept/AERB through an adequate or representative sample. The authorisation by the State Maritime Board would depend on the clearance provided during the verification process and by other authorities. The ship owner could apply for a review or appeal, if authorisation was not granted. ⁹⁰		
Ship- Breaking	 A recycler was required to submit an application as given in Form 2 of GMB notification dated 5thJuly 2003, with the Dismantling Plan and a copy of Recyclin Facility's Management Plan, in order to get permission for recycling.⁹¹ The following manner for the grant of clearance by SMB/SPCB/Custom Department for ships for dismantling at Ship-Breaking Yards was suggested:⁹² (i) Asbestos dust and fibres would be removed in enclosures(with Bl specifications) (ii) The removed asbestos and broken pieces of ACM sheets/panels would be packed in leak-proof synthetic packets and subsequently disposed off secured landfills, so that the packets are solidified by combining with cemen The ACMs that are recovered and are reusable could be sold for reuse accordance with the law in operation. (iii) The workers engaged in the task of asbestos removal/handling were to be provided with PPEs such as masks under positive pressure (or masks or respirators adhering to the BIS specifications for asbestos handling) (iv) There would be regular scrutiny of Asbestos fiber concentrations. (v) The GMB, the Director Industrial Safety and Health in the Government of Gujarat, the GPCB, the Customs authorities, and the Petroleum Safe Organisation were to be responsible for ensuring adherence to the regulation in Gujarat.⁹³ 		

TABLE - 7

88 Id.

89 Id.

90 Id.

91 Id.

92 Id.

93 Id.

THE ROLE OF THE TEC IN THE DISMANTLING OF VARIOUS SHIPS

In addition to these general recommendations, in some specific cases, the TEC made certain recommendations regarding the proper procedure for ship dismantling. These formed the basis of subsequent Supreme Court orders. Two such cases have been discussed herein.

THE CASE OF 'BLUE LADY'

The issue before the Court was whether a French passenger liner named, 'Blue Lady' should be permitted to be dismantled at the Alang port in Gujarat. The Court asked for a report from the TEC within 6 weeks to decide on the question of dismantling. It was directed to involve the GMB and the GPCB in the decision-making process. The Court specifically asked to focus on the following three aspects:

- a) Whether the recycler had complied with the pre-conditions for dismantling?
- b) Whether the submission of the applicant that 80% of the asbestos is reusable was correct or not?
- c) What steps were taken to control and mitigate the negative environmental impact of the hazardous waste generated during dismantling process?94

Recommendations by the TEC

In pursuance of the Order of the Supreme Court dated 6th September 2007, the TEC submitted a report regarding the Blue Lady, which was accepted by the Court.⁹⁵ The TEC recommended the following:

- Permitting the Blue Lady to be dismantled at the Alang port in Gujarat, according to the plan submitted by the M/s Priya Blue Industries Pvt. Ltd. (recycler).
- The regular monitoring by an authority of the ship-breaking operations of the Blue Lady, to ensure the safety of workmen and the environment. ⁹⁶

⁹⁴ Id.

⁹⁵ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995 (SC).

⁹⁶ Id.

The Observations of the TEC

- Not even a single kilogram of asbestos and/or ACM existed as cargo, rather they existed as "material of construction" in numerous vessel components. The majority of ACM (85%) was present in the partitions and ceilings of the rooms and galleries.
- The material that is recyclable alone could be sold. Thus, PCB (rubber) could not be sold.
- The two options left for the PCB (rubber) were incineration and dumping in landfills. Exercising either of the options could potentially lead to pollution. To avoid pollution, the plan of dismantling was adopted. Dismantling would simultaneously take care of the panels and insulation containing the asbestos.⁹⁷
- The dismantling plan submitted by Blue Lady adhered to Section 3.3.2 of the TEC Report, and the ACM and PCB (rubber) from the engine, vent room, and the insulated pipelines were removed from the engines. The removal plan submitted by the recycler was such that the major quantity of the ACM was in the form of structures such as wall partitions, roofings in the rooms and galleries. Therefore, they were reusable.
- The need for air monitoring for the ACM was emphasised by the TEC, and it also exhorted the need for providing respiratory protection to such workers and those involved in waste generation like leak tests, etc.⁹⁸
- The TEC Report also approved the Recycling Management Plan.

The Court accepted the Report and opinion of the TEC and finally granted permission to the recycler to dismantle the "Blue Lady".⁹⁹

THE CASE OF 'ORIENTAL NICETY'

On 9th May, 2012, the Court had to examine the request for the grant of permission for the beaching and dismantling of a ship named "Oriental Nicety". This time, the Court did not ask for any new reports from the TEC, and the latter did not provide the same. The Court itself inspected the issue and finally granted the permission for the beaching and dismantling. This was contingent on adherence to the recommendations of the

⁹⁷ Id.

⁹⁸ Id.

⁹⁹ Id.

Gujarat Maritime Board, the Gujarat Pollution Control Board and Atomic Energy Regulatory Board, and conformity with the recommendations of the TEC Report dated 10.05.2007.¹⁰⁰

ANALYSIS OF THE WORKING OF THE TECHNICAL EXPERTS COMMITTEE

The primary reason for the constitution of the TEC was to examine the sufficiency of the infrastructure of the Alang ship-breaking yard, to indicate any deficiencies, and to recommend measures for the redressal of the said deficiencies.¹⁰¹ The TEC submitted a report which detailed several aspects of ship-breaking, and also provided recommendations which were accepted by the Apex Court. The Court made the recommendations as mandatory guidelines, in the absence of any law or guidelines on the issue of ship-breaking. The TEC became *functus officio* through the order of the Court in March 2007.¹⁰²

However, there were a few aspects that the TEC failed to address. One such aspect was the dilution of the difference between hazardous and non-hazardous metals in some cases. There might be situations where wastes are imported which are non-hazardous *per se*, but have hazardous properties. Such situations could arise during the import of steel scraps with explosives, or the import of dead ammunition with one live bomb shell. Such an incident occurred when eleven trucks, which contained imported steel metal scraps, were taken into a steel smelting unit named Bhushan Steels and Stripes Limited. They exploded, resulting in the death of ten workers.¹⁰³ It is important to note that the Hazardous Wastes (Management and Handling) Rules, 1989 as amended in 2003, which were in operation when the TEC was constituted, did not categorise steel and iron scrap as a HW. They only categorised them as waste. However, Rule 3(14) of the 1989 rules did categorise anything explosive or inflammable as HW. Thus, technically, iron scrap, if imported with explosives, would be HW. Going by the recommendation of the TEC, an adequate sample or a representative sample would need to be verified by Dept/SPCB/Explosives Dept/AERB. However, in such

¹⁰⁰ Research Foundation for Science, Technology and National Resource Policy v. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order dated 30.07.2012 (SC).

¹⁰¹ Research Foundation for Science, Technology and National Resource Policyv. Union of India, Unreported Judgements, Writ Petition (Civil) No. 657 of 1995, Order dated 17.02.2006 (SC).

¹⁰² Id.

¹⁰³ Just Dump It, Down to Earth (June 07, 2015), https://www.downtoearth.org.in/coverage/just-dump-it-12018.

situations, the verification of samples would not be enough since there could be only one live shell in the entire consignment of dead ammunition, or one explosive in the entire steel scrap. In such cases, there could be an accident. The TEC did not recommend measures that could deal with such a contingency, such as mandating the importer to carry a pre-shipment inspection certificate for the metal scraps.

MONITORING COMMITTEE, NGT

The Supreme Court disposed off the case of *Research Foundation for Science, Technology and Nature Resource Policy* v. *Union of India & Ors.* by passing the final judgment on 6th July 2012. An interim application was later filed in the Court raising the issue of non-compliance with this final judgment. The Court noted that the directions that were sought in the application would require an elaborate examination of the issues, which is possible only with the help of experts. Subsequently, the Court, through its order dated 18th July, 2018, referred the matter to the National Green Tribunal (NGT). The Principal Bench of the NGT, through its order dated 5th December, 2018, directed the matter to be considered by a Monitoring Committee.

CONSTITUTION OF THE MONITORING COMMITTEE

The Monitoring Committee was primarily established to report on the status of the implementation of the HW Rules, with specific reference to the issues raised in *Rajiv Narayan & Anr. v. Union of India &Ors¹⁰⁴ before the NGT. Thus, on the basis of the NGT order dated 30th July 2018, the CPCB constituted the Committee. Thereafter, the NGT directed the Committee to examine the issues raised in Research Foundation for Science, Technology and Nature Resource Policy v. Union of India.*¹⁰⁵ The function of the Committee was to scrutinise the remediation of the contaminated sites, and examine the capacities of the landfill sites etc. The Committee was required to complete the assignment by 30th November 2018. However, it sought a two-month extension, which the NGT granted through an order dated 5th December 2018. Similarly, the terms of reference were also revised.¹⁰⁶

¹⁰⁴ Rajiv Narayan &Anr. v. Union of India &Ors., Unreported Judgements, Original Application No. 804 of 2017 (NGT).

¹⁰⁵ Research Foundation for Science, Technology and Nature Resource Policy v.Union of India, IA No. 63 of 2012 (NGT).

¹⁰⁶ Id.
Members of the Monitoring Committee

Dr. Ajay Deshpande, Former Expert Member, NGT was the Chairman of the Committee. The other members of the Committee were Dr. A. N. Vaidya, Chief Scientist & Head, Solid and Hazardous Waste Management Division, National Environmental Engineering Research Institute (NEERI), Nagpur; Dr. D. C. Sharma, Prof., Department of Civil Engineering, (Former Additional Director, CPCB) Bengaluru; Dr. A. Manoharan, Former Senior Scientist, CPCB, Chennai; Dr. Singh, Sc D., HSMD Division, MOEF and Bharat K Sharma, Scientist 'E', WM-II Division and Nodal Officer, CPCB, Delhi who was the Member Convener.

INTERIM REPORT OF THE MONITORING COMMITTEE

The Committee prepared an interim report by stressing mainly on the NGT order passed in *Rajiv Narayan* v. *Union of India & Ors.*¹⁰⁷ The following issues were covered in the report:¹⁰⁸

- a) Whether the Hazardous and Other Wastes (Management and Transboundary Movement) Rules (HOWM Rules), 2016 are being implemented by concerned agencies in India?
- b) Whether there are any incidents of non-compliance or shortfall or not? If present, then an indication to that effect?
- c) The necessity for action in the Indian states for effectively executing the HOWM Rules.
- d) What are the measures that are required for compliance of HOWM Rules, 2016 and the CPCB guidelines?

The Report highlighted (a) the process that is used for completing the assigned tasks, (b) adherence to the HOWM Rules, 2016, and (c) the present state of affairs of hazardous waste in India. The Committee's report relied on primary data that was collected by it during its field visits, and the secondary data from the authorities like PCCs, MoEF&CC, CPCB, etc.

¹⁰⁸ Interim report of the Monitoring Committee on Management of Hazardous Waste, Indian Environmental Portal, http://www.indiaenvironmentportal.org.in/files/file/Interim%20Report%20of%20Monitoring %20hazardous%20waste.pdf (last visited Dec. 20, 2020).



¹⁰⁷ Rajiv Narayan & Anr. v. Union of India & Ors., Unreported Judgements, Original Application No. 804 of 2017 (NGT).

COMPLIANCE WITH HOWM RULES, 2016

The Monitoring Committee observed that though the environmental jurisprudence of India is mainly rooted in the triple principles of sustainable development, precautionary and polluter-pays principle, still there is a general tendency of the legislators and the judiciary to prioritize precautionary principle over the polluter pays principle with respect to implementation. This may be attributed to the complexity of the polluter pays principle, which makes it tricky to identify the polluter and assign them their responsibility.¹⁰⁹

The Committee observed that with the increased understanding of the complicated relationship between hazardous waste and the environment, the laws relating to the hazardous waste management have changed over time. For example, the definition of the term "hazardous waste" in the HOWM Rules was amended in 2016.

On the level of implementation, the Committee identified the main difficulty in the management of hazardous waste as the lack of reliable information on the quantity and the categorization of the generated hazardous wastes. Thereafter, it recommended the following: a) a strong reporting mechanism to provide an almost precise estimate of the amount of the generated hazardous waste and its characteristics, b) an understanding of the practices of treatment and hazardous waste disposal mechanism, and c) identification of those issues which need immediate attention.¹¹⁰

The Committee streamlined the efforts for environmental governance with reference to hazardous waste as follows¹¹¹:

- a) Scientific assessments: This included conducting the assessments on the environmental impact regarding exposure to HW that are based on the findings. This would help the government in taking actions.
- b) Legal instruments: Legal instruments such as policies and control systems should be enacted for governance of the HW.

¹⁰⁹ *Id*.

¹¹⁰ *Id*.

¹¹¹ *Id*.

- c) Implementation: Facilitating the states in implementing national programmes in order to make better HW management through financing and designing, and developing policies to effectively deal with the issue of non-compliance.
- d) Monitoring and Evaluation: Aiding the states in monitoring, evaluating and reporting on the improvement in implementation of the national programmes and in preparing annual report to examine the action undertaken in managing HW.

The Committee opined that the current state of chemicals and waste governance in the country is fragmented. Different instruments have been developed from time to time to deal with specific challenges. In this context, the Committee referred to SAICM (Strategic Approach to International Chemicals Management) policy framework on the issue of the integrated management of chemical and hazardous wastes, to ensure that the chemicals that are generated and utilised are accounted for. It also ensures the best utilisation by cross-accounting for the chemicals utilized, with the hazardous waste that is produced. This could do away with any existing uncertainty arising out of the data that are provided by the industries.¹¹²

The Committee recommended conducting audits of important industries on the basis of the mass balance principle of Environmental Engineering. The present system of HW regulation through tracking the source of the industry, reporting and managing has worked good in some industries for the past three decades. Yet, many toxic chemicals are still released into the environment through some existing provisions like permitted discharges, exclusions to regulations, non-point source pollution, and other problems associated with hazardous waste management.¹¹³ The Committee stressed on the importance of incorporating both scientific and management strategies in the implementation of HW management, to aid in a uniform application of the polluter pays and precautionary principle for ensuring sustainable development.¹¹⁴

- 112 Id.
- 113 *Id*.
- 114 Id.

THE COMMITTEE'S FINDINGS ON THE STATUS OF COMPLIANCE OF HAZARDOUS AND OTHER WASTES (MANAGEMENT AND TRANSBOUNDARY MOVEMENT) RULES, 2016¹¹⁵

HAZARDOUS WASTE IDENTIFICATION, GENERATION AND THEIR TRACKING

Recommendations of the Committee

- 1. The Monitoring Committee directed SPCBs/PCCs to initiate a technical and scientific process for evaluating applications to implement the HOWM Rules 2016.
- 2. The Committee suggested the SPCBs to verify essentials enumerated in Rule 6(2) and (3) of the HOWM Rules 2016.
- 3. The Committee recommended the SPCBs/PCCs to stipulate categories, quantity, manner of disposal, etc. of the authorized hazardous waste produced from industrial activity

INVENTORY ON HAZARDOUS WASTE GENERATION AND ITS MANAGEMENT

Observations

The Committee observed that data provided by SPCB, along with data related to interstate transport of hazardous waste was left unverified in the inventory on hazardous waste generation and its management. The inventory also exempted the hazardous waste arising from execution of other laws like MSW, E-waste, BMW, Battery Rules etc.

Recommendations

The Committee, recognizing the need for a strengthened process to develop the annual inventory of hazardous waste, made the following recommendations:

- 1. Creation of "National Hazardous Waste Tracking System", a web portal, by CPCB to track production, transportation (authorized and unauthorized), disposal, interstate movement, etc. of hazardous waste.
- 2. Compliance with HOWM Rules, 2016 by the hazardous waste occupiers to be ensured by SPCBs/PCCs.

115 Id.

RECYCLING AND UTILISATION OF HAZARDOUS WASTE

Observations and Recommendations

- 1. The Committee observed lack of recycling of hazardous waste by states like Gujarat and Maharashtra and recommended the introduction of EPR (Extended Producer Responsibility) to make the entities involved in producing waste liable for their actions throughout the life cycle of the product, i.e., till its disposal.
- 2. The Committee recommended capacity building for SPCBs, other stakeholders and other industries to ensure the reuse of enough amount of hazardous waste.
- 3. The Committee also recommended an amendment to the HOWM Rules, 2016 and pre-processing and co-processing of the HW. Suggestions were made to incorporate waste exchange bank centres within the HOWM Rules, 2016. It also suggested the finalisation of Standard Operating Procedures/ Protocol for such waste exchange centres.

By-Products and Spent Solvent Management

By-Products

The Committee suggested the consideration of the following questions for distinguishing between by-products and hazardous waste. The criteria set out in Point II (a), (b), (c), and (d) were suggested to be met for declaring anything as by-product:

I. The Intention of generator

a) Whether the generator has intentionally chosen to produce the concerned material or not?

II. Certainty of further use of material

- a) Whether the subsequent use of the material is certain or probable?
- b) Whether such subsequent usage bring any advantage to the waste holder financially or not?
- c) Whether the material can be reused without any more subsequent processing or not?
- d) Whether it is a part of the continuing process of production or not?



III. Other factors to be taken into account for considering a material as waste

- a) Whether any use except the disposal of the product be envisaged or not? Whether the product's use is environment-friendly or it requires some environmental protection measures?
- b) If the quantity of the material generated has to be restricted on the account of the purpose for which it is used, then that could indicate that the material is a hazardous waste.

Spent Solvent management

The term "solvent" refers to the chemical substances, generally organic liquids that are utilised for dissolving/diluting other substances or materials and HOWM Rules, 1989, 2008 and 2016 categorize spent solvent as a hazardous waste. Spent solvent management has been a matter of concern for the SPCBs/PCCs and CPCB. The Committee discovered unauthorised discharge of the spent solvent in breach of HOWM Rules, 2016 and discussed the issue of spent solvent management in three segments.

a) Spent solvent management within the industry

The following recommendations were made:

- a. Awareness program should be conducted by MoEF&CC to encourage the use of environment-friendly solvents.
- b. All the main industries engaged in producing spent solvent are required to maintain records of generation, storage and disposal of hazardous waste, according to the HOWM Rules, 2016.
- c. The State Governments are required to integrate the impact of the solvents on human health through their labour departments in the compulsory health checkups as per the HOWM Rules, 2016.

b) Spent solvent recovery plants

The Committee made the following recommendations:

a. The SPCBs/PCCs were directed to publish on their website, the necessary information regarding spent solvent recycling industries in the concerned State/UT within a month, and send a copy of the same to the CPCB.

b. SPCBs/PCCs were directed to carry out inspection and audit of industries and ensure adherence to HOWM Rules. They were also directed to ensure that industries have information regarding requirement of obtaining authorization under Rule 9.

c) Unauthorised spent solvent discharges resulting in inefficient functioning of the CETP

The Committee further directed the SPCBs to make an immediate assessment of the hazardous sludge from the CETPs, conduct Volatile Organic Compound (VOC) monitoring in the industrial areas and take legal actions against CETPs indulging in unscientific discharge, untreated effluent and hazardous waste in accordance with Rule 23(1) of HOWM Rules, 2016, with NGT's approval.

CAPTIVE AND COMMON DISPOSAL FACILITY FOR HAZARDOUS WASTE

Recommendations

- 1. The Committee recommended design of TSDF to be modified as per the CPCB standards and formulation of provisions for leachate minimization, gravity flow and collection of water.
- 2. The Committee directed an assessment of all the landfills that were built prior to year 2000 to check on leachate infiltration and mechanism of hazardous waste treatment. Third party audits to verify TDSF's operations and ensure compliance with the HOWM Rules, 2016 were also directed. SPCBs was directed to regularly monitor the daily leachate generation, its quality, etc.
- 3. The Committee recommended refusal of permission by local authorities to build houses in the buffer zones of TSDFs. It suggested the destruction of the already constructed houses or acquisition of the same by the government. The setting up of TSDFs in moderately high HW producing states was also to be expedited.

IMPORT-EXPORT OF HAZARDOUS WASTE

Recommendations

1. *Harmonization of Basel codes with ITC (HS codes):* The Committee noted that the Ministry and the DGFT permits for import-export on the basis of Basel codes and HS codes respectively. The usage of two different codes might lead to

confusion. Therefore, to avoid such confusion, the two codes were suggested to be synchronised.

- 2. *Risk management assessment:* The Committee noted that the customs authorities use the risk management system (RMS) for facilitating the clearance of low-risk consignments based on the acceptance of the importer's self-assessment, and without carrying out any examination. The Committee also noted the presence of many kinds of waste streams that are not integrated in the RMS.
- 3. Collaboration between regulating authorities and Separate budget: The Committee suggested regular collaboration, consultation, and training between the MOEF&CC, CPCB, SPCBs, customs and ports. Funds were recommended to be allocated for Customs authorities to facilitate the environment-friendly management of seized hazardous wastes.

LABORATORY FACILITIES

For laboratories, the Committee recommended that all environmental laboratories should make separate sub-section called the Hazardous Waste Laboratories; must possess the necessary instruments/ equipment as stipulated by the Committee; should obtain laboratory accreditation according to ISO 17025: 2017 (NABL) or Laboratory Recognition under the Environment (Protection) Act 1986 or both; and, must be given the option to explore the probability of mobilizing or obtaining funds for establishing or upgrading the Hazardous Waste Analysis Laboratory.

ENFORCEMENT OF DUTIES ASSIGNED UNDER HOWM RULES, 2016¹¹⁶

The Committee examined the implementation efforts by SPCBs/PCCs and State/ UT Governments according to the duties assigned under Schedule VII and other provisions of the HOWM Rules, 2016. It made the following observations:

Duties assigned	Observations of the Committee
to SPCB/PCC	
and State/UT	
Government	
Issuance of	(i) Assam, Chhattisgarh, J&K, Odisha, Manipur, Kerala, Telangana, and
Authorization	Uttar Pradesh grant authorization within 120 days. The other SPCBs/ PCCs grant authorisation even after the stipulated time of 120 days.
	(ii) Although most of the SPCBs/PCC provided the information regarding the number of authorisations that they had granted, Punjab, West Bengal, Madhya Pradesh and Himachal Pradesh and J&K had not provided the said details, and details regarding the category, source of generation and the usage of the HW.
	(iii) Other than the SPCB of Himachal Pradesh, Karnataka, Maharashtra and Tamil Nadu, the other SPCBs did not examine the occupiers' financial capabilities to combat with emergency response/accidental release while granting authorization.
Inspection of	Barring Uttar Pradesh, J&K, Telangana, Bihar, Haryana, Rajasthan,
Hazardous Waste	Chhattisgarh, Tamil Nadu, Karnataka and Gujarat, certain states had not
Units	yet informed the policy for regularly inspecting the HW handling units.
	The Committee also noted that there was no uniformity in information
	that was reported regarding the frequency and actual number of HW
	handling units that were inspected in 2017-18.
Show-cause/court	Incidents of violations/issuance of show-cause notices/ directions for
cases	closure to the non-complying units were only reported by 15 SPCBs/
	PCC, and Maharashtra was the only state to report the filing of FIRs. Only
	reporting the incidents of violations without reporting the action taken
	against the defaulters would not suffice as this would imply that no actions
	had been taken by the SPCB/PCCs in case of grave violations.
Financial Penalty &	No state had built in-house 'Hazardous Waste Response Team' as
Liability Rule 23	was required by the CPCB guidelines on "Implementing Liabilities for
	Environmental Damages due to Handling & Disposal of Hazardous
	Waste and Penalty", other than Uttar Pradesh, J&K, Tripura, Rajasthan,
	Chhattisgarh, Puducherry, Jharkhand, Mizoram, Chandigarh and West
	Bengal.
Monitoring	The SPCB/PCCs of Uttar Pradesh, Telangana, Odisha, Rajasthan,
	Puducherry and Tamil Nadu were examining the conditions of export-
	import as required by the provisions

TABLE - 8

Verification of	The SPCBs of Bihar, Haryana, Odisha, UP, Telangana, Gujarat, Rajasthan,
annual returns	numbers of occupiers that were granted authorisations and had submitted
	the annual returns in the year 2017-18. The SPCBs of only Maharashtra,
	Rajasthan, Telangana and West Bengalhad provided information
	regarding the verification of annual returns of all the units. All the other
	states, except some, were not receiving the annual returns from the HW
	generating units. The exceptional states included Chhattisgarh, Haryana, Telangana and UP.
Policy for recycling/	Other than SPCB/PCCs of Haryana, West Bengal, Mizoram, Kerala,
co-processing	Jharkhand, Chhattisgarh, Assam, and Mizoram, the other states possessed
	a policy for inspiring reuse/recycle and co-processing, rather than disposal
	through TSDFs.
Disposal facility	The majority of the SPCBs/PCCs had examined the performance of the
	captive/common incinerators.
	Except the SPCBs/PCCs of Madhya Pradesh, the other states were
	examining the wells located within and outside TSDFs/captive secured
	the TSDF was also being examined by the SPCBs/PCCs.
Public Complaint	Most states did not inform about any complaint that is received from the
	nearby agricultural farms/residents near the TSDF, except for Telangana,
	Odisha, Uttar Pradesh, Maharashtra, Puducherry, Karnataka and Gujarat
Laboratory and HW	The majority of the SPCBs/PCCs lacked satisfactory laboratory facilities to
Cell	facilitate sampling & analysis of hazardous waste according to the HOWM
	Rules, 2016. There was a lack of dedicated hazardous waste cell in states,
	with several units generating hazardous waste. These states included
	Chnattisgarn, Jharkhand, Tamii Nadu, West Bengal and Madhya Pradesh.

The Committee noted the urgent necessity to use scientific methods and strict legal actions in case of non-adherence, for strengthening the implementation by the SPCBs/PCCs. Moreover, the Committee noted the need for capacity-building through adequate manpower, better infrastructure, training of officials, documentation, and use of Information Technology, etc. The Committee further noted the necessity to make the governments of the States/UTs aware about their duties under the HOWM Rules, 2016.

COMPLIANCE OF THE ORDERS OF THE NGT DATED 30.07.2018¹¹⁷

After reviewing the data received from the state governments and the SPCBs/PCCs on adherence to the NGT's orders dated 30th July, 2018, on the point of building common TSDFs within three months from order date, the Committee observed that

Assam, Delhi, Mizoram, Nagaland, Jammu & Kashmir, Lakshadweep, Chhattisgarh, Goa, Odisha and Sikkim, responded and complied with the orders of the NGT, while Andaman & Nicobar islands, Arunachal Pradesh, Bihar, Chandigarh, Meghalaya, Manipur, Tripura, Puducherry, Himachal Pradesh, Kerala and Punjab did not even respond to the action taken to comply with the NGT order. Out of 21 states/UTs, 17 lacked a common TSDF (common Secured Landfill Facility or common incinerator), and the remaining 4 lacked common incinerators.

After reviewing the data received from the state governments and the SPCBs/PCCs on adherence to the NGT's orders dated 30th July, 2018, for commencing action against the defaulting units, the Committee pointed out that barring Odisha, the other states and UTs had failed to comply with the orders of the NGT.

Recommendations

The Committee observed that other than the states of Goa and Odisha (which had exceeded the stipulated time of 3 months in implementing the order), no other state out of 21 states submitted any time-bound action plan for building a common TSDF. The Committee noted that the North-Eastern states of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Tripura and Nagaland generate comparatively lessquantity of HW. Therefore, it recommended that these states could share a common TSDF with Assam. Similarly, Sikkim and West Bengal could share a common TSDF. The UTs of Andaman & Nicobar and Lakshadweep were recommended to create an inventory of various HW produced from automobile service centres/workshops/garages, etc. They were also recommended to develop an Action Plan for the management of such waste within 2 months, on a priority basis. On the point of commencing actions against the defaulting units, the Committee suggested the defaulting units to be brought to the attention of the NGT, so that suitable direction/action can be taken.

The NGT accepted the report by its order dated 12th April, 2019. It directed the Chief Secretaries of the States, and MOEF&CC and CPCB, to examine that the suggestions of the Committee, and ensure that the recommendations are adhered to. The NGT directed the Monitoring Committee to finish the remaining task within 3 months.¹¹⁸

¹¹⁸ Rajiv Narayan &Anr. v. Union of India &Ors., Unreported Judgements, OA No. 804/2017, Order dated 26.08.2019 (NGT).

FINAL REPORT OF THE MONITORING COMMITTEE

The following issues were considered by the Monitoring Committee in its final report:

- 1. Contaminated Sites and issues related to them;
- 2. Import and Export of HW and the related issues;
- 3. Waste Reception Facilities for wastes that are produced from ships and the related issues;
- 4. Effect of HW on the Workers' Health;
- 5. Status of compliance with the Supreme Court order dated 14^{th} October, 2003.

The Committee recommended that the accumulated waste should be disposed through Treatment, Storage and Disposal Facilities (TSDFs) or on-site secured landfilling (SLF). The Committee also recommended the laying down of guidelines to identify and assess the contaminated sites, conducting capacity building programmes for the officials of SPCBs/PCCs for dealing with the subject, examining 195 probable sites of contamination, resolving the issues regarding Centre-State monetary for remediation of contaminated sites, revising the policy framework, initiating the speedy disposal of assignments that were confiscated after being illegally imported, developing laboratories, finalizing the procedure for taking bank guarantee from importers to defend against illegal import of HW, strengthening the system of risk management, laying down the necessity of reception facilities, the creation of terminal and ship repair ports providing protection to the workers handling the waste, initiating institutional reforms, and coming up with a national policy for sound implementation of the HOWM Rules, 2016.¹¹⁹

DIRECTIONS OF THE **NGT**

The NGT accepted the recommendations of the Committee in absence of an objection being raised against the same. $^{\scriptscriptstyle 120}$

It directed the States/UTs, CPCBs/SPCBs/PCCs, the CBIC, the port authorities, the DGFT, the MoEF&CC, the Ministry of Shipping, Labour and Employment and the Department of Labour of all the concerned States/UTs to initiate the steps to comply with the recommendation of the Committee within the stipulated time-frame. The defaulters would be liable to pay environmental compensation.¹²¹

¹¹⁹ *Id*.

¹²⁰ Id.

¹²¹ Id.

The NGT further directed the following:¹²²

- i. The updation and verification of the inventories of HW by check-tests to ensure the reliability and credibility of the same.
- ii. The SPCBs of the states /UT of Dadra & Nagar Haveli, Haryana, Daman & Diu, Manipur, Lakshadweep and Nagaland were ordered to provide the relevant information within a month to the CPCB and SPCBs/PCCs, with their failure to do so leading to a fine of Rs. 10 lakh per month from 1st October, 2019.
- iii. The States which had failed to build TSDFs were directed to do so by 31st March, 2020, with a failure to do so attracting a fine of Rs. 10 lakh per month.
- iv. The identified 126 contaminated sites were directed to be cleared of the HW in 6 months. Not complying with this would invite a fine of Rs. 10 lakh/site as a matter of environmental compensation.
- v. The examination of the 195 probable contaminated sites was required to be done within six months, and removal of the contamination in the next six months.
- vi. The disposal/transfer/clearance of the site should be under the supervision of the CPCB, and according to the HOWM Rules.
- vii. The CPCB was directed to arrange finances from the environment funds that could be subsequently recovered from the erring people/industries.
- viii. The CPCB was directed to monitor adherence with the NGT's directions, and to submit an interim report on such compliance by consolidating all the data before 15th April 2020.

The Committee was successful in making state-wise specific observation and recommendations on the handling of the hazardous wastes. It also made detailed reports on the basis of the specific parameters of compliance laid down under the HOWM Rules, with respect to establishing common TDSFs, and specific actions that would have to be taken by them to comply with the Rules. As mentioned above, no objections could be raised by the opposing parties against the report of the Monitoring Committee, NGT.



Conclusion

This chapter examined the working of the four Committees established by the Supreme Court and the National Green Tribunal for monitoring the disposal and management of hazardous waste in the country, namely, the High Powered Committee (HPC), the Supreme Court Monitoring Committee (SCMC), the Technical Experts Committee (TEC), and the Monitoring Committee. The primary reason for the constitution of the HPC was to conduct a detailed examination of all the issues relating to hazardous waste, including its generation, its import and its disposal. The HPC's report covered a wide range of issues, and served as a major guide for the management of such toxic waste. It also led to the constitution of the Supreme Court Monitoring Committee on Hazardous Waste Management in 2003 but it failed to provide elaborate state-specific information about the industries generating HW, unlike the SCMC or the Monitoring Committee of the NGT.

While the SCMC, constituted after the HPC, did carry out a number of laudable initiatives, there continued to remain a few issues with respect to hazardous waste management that it failed to rectify such as its failure to ensure the adequate number of waste disposal facilities in all states, although it was successful in few and its failure to ensure implementation of the Supreme Court order that directed the SPCBs to provide hazardous waste generation data to the Central Pollution Control Board. The SCMC also failed to give a conclusive report on the matter of ship-breaking of the French Ship Clemenceau which was carrying hazardous waste and garnered disrepute for approving the hazardous wastes producing plants at Tuticorin.

The TEC was established with the dedicated mandate of examining the sufficiency of the infrastructure of the Alang ship breaking yard and to recommend measures for the redressal of deficiencies identified, if any. However, the TEC diluted the difference between hazardous and non-hazardous metals in some cases, which could have avoided explosions if pre-shipment inspection certificates were made mandatory by the TEC for the importer. The Monitoring Committee of the NGT came up with the most comprehensive list of observations and recommendations on the status of the implementation of the HW Rules. It was also required to scrutinise the remediation of the contaminated sites, and examine the capacities of the landfill sites, etc., import and export of HW, waste reception facilities for wastes that are produced from ships and effect of HW on the Workers' Health. The comprehensive report presented by the Monitoring Committee gave little room for no objections by the opposing parties.

While the report of the Monitoring Committee was very comprehensive and covered all aspects of the management and disposal of hazardous waste, a future assessment and empirical study of the handling of hazardous wastes would be the true test of its findings and implementation of its recommendations.

PART - B

Focus Areas under the Rotterdam Convention

CHAPTER 7

Assessing Legal and Regulatory Framework in India that Governs Pesticides and Industrial Chemicals that Impact Health and Environment

OVERVIEW OF THE PESTICIDE SECTOR IN THE COUNTRY

Increase in demand for agricultural produce, and commercialisation of agriculture, have increased the demand for and usage of agrochemicals such as pesticides, insecticides, herbicides, rodenticides, and fungicides in India. The Ministry of Agriculture and Farmer's Welfare, the Ministry of Environment Forest and Climate Change and the Ministry of Chemicals are jointly responsible for regulating pesticides in India. As per the India Pesticide Industry Analysis, the compound annual growth rate of the Indian pesticides industry has been recorded at 14.7%, which was estimated to be Rs. 2,29,800 million in the year 2018 with a 12% to 13% growth rate per annum¹ and 214 billion in 2019.² The role of the private sector is the highest in the retail sale of pesticides, being as high as 90%.³ Agriculture and its allied activities, which include the pesticides sector, have a 16.5% contribution to the Gross Domestic Product (GDP) of the country, and the growth rate in this sector was calculated at 2.8%.⁴

PRODUCTION OF PESTICIDES IN INDIA

The principal pesticides that were produced during the period between 2014-15 to 2018-19⁵ in India, have been indicated in the table below:

¹ Indira Devi et al, *Pesticide Consumption in India: A Spatiotemporal Analysis*, 30Agricultural Economics Research Review163(2017).

² *Pesticides Market Size, Share, Trends & Forecast 2020- 2025*, IMARC, https://www.imarcgroup.com/ indian-pesticides-market (last visited May 28, 2020).

³ Devi et al, *supra* note 1.

⁴ *Economic Survey 2019-20*, Prs Legislative Research, https://www.prsindia.org/report-summaries/ economic-survey-2019-20 (last visited May 28, 2020).

⁵ *Production of Key Pesticides During 2014-15 to 2018-19*, DIRECTORATE OF PLANT PROTECTION, http://ppqs. gov.in/statistical-database (last visited May 28, 2020).

Pesticide	2014-15 (Unit M.T. Tech. Grade)	2015-16 (Unit M.T. Tech. Grade)	2016-17 (Unit M.T. Tech. Grade)	2017-18 (Unit M.T. Tech. Grade)	2018-19 (Unit M.T. Tech. Grade)
Acephate	17,970	16,580	16,265	18,271	19,633
Chlorpyrifos	9,730	6,870	5,867	7,984	7,143
Cypermethrin	8,590	8,526	7,875	8,246	10,952
DDT	3,630	2,090	2,263	1,265	1,366
DDVP	6,660	7,219	8,130	8,127	9,136
Malathion	2,240	2,040	2,255	3,293	4,390
Monocrotophos	6,970	5,484	6,577	5,500	5,298
Pendimethalin	2,260	2,818	4,038	3,780	2,822
Phorate	6,620	5,916	5,910	7,016	5,847
Profenofos Technical	7,580	6,853	10,504	9,945	12,452
Mancozeb	61,400	66,380	78,480	70,245	69,331
2,4- D	11,620	18,456	23,358	25,830	24,236
Glyphosate	9,690	6,960	6,352	6,294	6,684
Pretilachlor Technical	1,880	1,941	2,581	3,597	3,626
Aluminium Phosphide	5,050	5,750	6,402	4,771	4,913

TABLE - 1

State- wise and Union Territories Production of Pesticides in India⁶

TABLE - 2

State/ Union Territory	2015-16 (Unit M.T. Tech. Grade)	2016-17 (Unit M.T. Tech. Grade)	2017-18 (Unit M.T. Tech. Grade)	2018-19 (Unit M.T. Tech. Grade)
Andhra Pradesh	2,713	2,015	1,738	1,689
Bihar	831	790	840	850
Chhattisgarh	1,625	1,660	1,685	1,770

⁶ *State-Wise Consumption of Pesticides*, DIRECTORATE OF PLANT PROTECTION, http://ppqs.gov.in/statistical-database (last visited May 28, 2020).

Goa	48	22	24	25
Gujarat	1,980	1,713	1,692	1,608
Haryana	4,100	4,050	4,025	4,015
Himachal Pradesh	450	341	467	322
Jharkhand	493	541	619	646
Karnataka	1,434	1,288	1,502	1,524
Kerala	1,123	895	1,067	995
Madhya Pradesh	732	694	502	540
Maharashtra	11,665	13,496	15,568	11,746
Odisha	994	1,050	1,633	1,609
Punjab	5,743	5,843	5,835	5,543
Rajasthan	2,475	2,269	2,307	2,290
Tamil Nadu	2,096	2,092	1,929	1,901
Telangana	993	3,436	4,866	4,894
Uttar Pradesh	10,457	10,614	10,824	11,049
Uttarakhand	217	198	210	195
West Bengal	3,712	2,624	2,982	3,190
Arunachal Pradesh	17	18	N.A.	5
Assam	185	306	241	256
Manipur	30	33	27	N.A.
Meghalaya	N.A.	N.A.	N.A.	N.A
Mizoram	N.A.	9	N.A.	26
Nagaland	20	20	20	21
Sikkim	Organic State	Organic State	Organic State	Organic State
Tripura	293	298	330	349
Andaman & Nicobar Islands	N.A.	N.A.	N.A.	N.A.
Chandigarh	N.A.	N.A.	N.A.	N.A.
Dadra & Nagar Haveli	N.A.	N.A.	N.A.	N.A.
Daman & Diu	N.A.	N.A.	N.A.	N.A.
Delhi	N.A.	88	N.A.	110

Chemical and Hazardous Waste in India: A Sectoral Analysis

Jammu & Kashmir	2,251	2,188	2,430	2,459
Ladakh	N.A.	N.A.	N.A.	N.A.
Lakshadweep	N.A.	N.A.	N.A.	N.A.
Puducherry	43	43	43	42

Data on Pesticides Production in Comparison with other Chemicals in India

The share of the pesticide sector in relation to other chemicals in terms of manufacturing⁷ has been graphically exhibited below:



Data on Pesticides Imports in Comparison with Other Chemicals in India

The share of the pesticide sector in relation to other chemicals in terms of imports⁸ has been graphically exhibited below:



⁷ *Chemical and Petrochemical Statistics At a Glance- 2018*, DEPARTMENT OF CHEMICALS AND PETRO-CHEMICALS, https://chemicals.nic.in/sites/default/files/Chemical%20and%20Petrochemical%20Statistics%20 at%20a%20glance%20_2018.pdf (last visited May 28, 2020).

8 Id.

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Data on Pesticides Exports in Comparison with other Chemicals in India

The share of the pesticide sector in relation to other chemicals in terms of exports⁹ has been graphically exhibited below:



Public Private Partnership in the Pesticides Sector

There are three major public sector undertakings which are involved in the manufacture, export, and import of pesticides. They are Hindustan Organic Chemicals Ltd., Hindustan Insecticides Ltd. and Hindustan Fluorocarbons Ltd.¹⁰ Some of the top private sector companies that deal with pesticides are Bharat Rasayan Ltd., Insecticides India Ltd., Bayer Crop Science Ltd., BASF India Ltd. and UPL Ltd.¹¹ Private companies contribute up to 80% in the pesticide sector in terms of sales, with only 20% contribution by public sector companies.¹²

THE ROTTERDAM CONVENTION

The Rotterdam Convention is a collaborative effort for the promotion of human health and environment. It furthers these goals through mandating the exchange of necessary information on several hazardous industrial chemicals and pesticides, and the maintenance of transparency in the international trade between parties. The aim of the Rotterdam Convention is to encourage sustainable efforts amongst

⁹ Id.

¹⁰ Annual Report 2016-17, DEPARTMENT OF CHEMICALS AND PETRO-CHEMICALS, https://chemicals.nic.in/sites/ default/files/Annual%20Report%202017%20English.pdf (last visited May 28, 2020).

¹¹ Raveendran, *Top 10 Pesticides Companies in India*, INDIAN COMPANIES, https://indiancompanies.in/indiatop-10-pesticides-company-pesticides-manufacturer/ (last visited May 28, 2020).

¹² Madan Sabnavisand & Urvisha Jagasheth, *Indian Agrochemicals Industry: Insights and Outlook*, CARE RATINGS, http://www.careratings.com/upload/NewsFiles/Studies/Agrochemicals.pdf (last visited May 28, 2020).

State Parties in the international trade of certain hazardous chemicals so that human health and the environment can be protected from potential harm, and to ensure the environmentally-sound use of such chemicals.¹³Article 3 of the Convention states that it applies to banned or severely restricted chemicals, and severely hazardous pesticide formulations. The Convention lists the banned and severely hazardous industrial chemicals and pesticides in Annex III. A chemical under the Convention has been defined as a substance obtained from nature or manufactured in the form of a preparation or a mixture, including pesticides. The Convention has also defined banned chemicals and severely restricted chemicals, the use of which is prohibited to protect human health and the environment.¹⁴ Another key definition relevant in the present context is that of a severely hazardous pesticide formulation, which is defined as a chemical created for use as pesticide that is capable of leading to severe health or environmental effects within a short span of time.¹⁵

For the inclusion of any chemical in Annex III, the States which are Parties to the Convention must, pursuant to Annex I and Art. 6, submit a proposal to the Secretariat, and after the review of the same by the Chemical Review Committee, the proposing party shall be assisted by the Secretariat. All State Parties are required to decide as to whether or not they will allow future imports of each of the chemicals in Annex III of the Convention. Two proposals should be received by the Secretariat for a particular chemical or group of chemicals to begin the Prior Informed Consent (PIC) procedure. The PIC procedure under the Convention entails formally obtaining and disseminating the decisions of importing parties as to whether they wish to receive future shipments of the chemicals listed in Annex III of the Convention. The PIC procedure also seeks to ensure compliance with these decisions on part of exporting parties. The responsible dissemination of information on chemicals helps the Parties of the Convention to remain updated about the effect of the different chemicals, when imported. The Convention seeks to give developing nations that do not have the necessary infrastructure for proper containment and utilization of certain chemicals, through Art. 6 and Annex IV, an opportunity to submit proposals for the inclusion of those chemicals in Annex III, on showing incidents of poisoning on exposure to the chemical in question.¹⁶ The Rotterdam Convention has been amended nine times

¹³ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade art. 13, Sept. 10, 1998, 38 ILM (1999).

¹⁴ Id. art 2(b) & 2(c).

¹⁵ Id.

¹⁶ Alek Mihajlovski, How does the Rotterdam Convention work to protect human health and environment?,

²¹⁸

since it entered into force on 24th February, 2004. It was last amended in 2019, when phorate and hexabromocyclododecane were added in Annexure III, and Annexure VII was adopted.¹⁷

THE ROTTERDAM CONVENTION AND THE INDIAN POSITION

India ratified the Rotterdam Convention on 24th May, 2005.¹⁸ Since Article 4 of the Convention requires that one or more national authorities have to perform the administrative functions relating to the Convention in the domestic sphere, India has authorized the Ministry of Environment, Forest and Climate Change, Ministry of Chemicals and Fertilizers and the Ministry of Agriculture and Farmers' Welfare to perform the role of national authorities that will undertake the functions of administering the Convention in the country.¹⁹

Article 5 of the Rotterdam Convention requires a State Party to notify the Secretariat if it takes a final regulatory action. As per the definition clause of the Convention, a final regulatory action is taken by a State Party to ban or severely restrict any chemical that causes harm to human health and/or the environment which, by its very nomenclature, will be final and will not require any kind of subsequent action. The first such regulatory action taken in India was to ban *"Benzidine and its Salts"*, Chemical Abstracts Service No. 92-87-5, which were earlier used in dyeing and color processing industries. These were banned because they posed a serious risk to human health, as they were capable of causing damage to blood and leading to bone marrow depression. On ingestion, they could lead to nausea, vomiting, liver damage and kidney damage.²⁰ Till today, a total of 40 pesticides/ formulations including Aldicarb,

19 Country Contacts, PRIOR INFORMED CONSENT OFFICIAL WEBSITE, http://www.pic.int/Countries/CountryContacts/tabid/3282/language/en-US/Default.aspx (last visited May 28, 2020).

SYNERGIES AMONG THE BASEL, ROTTERDAM AND STOCKHOLM CONVENTIONS, http://www.brsmeas.org/Default. aspx?tabid=5823#:~:text=The%20RC%20team%20promote%20shared,may%20be%20unsafe%20 for%20use (last visited May 28, 2020).

¹⁷ United Nations, Report of the Conference of the Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its ninth meeting, http://www.pic.int/TheConvention/ConferenceoftheParties/Meetings/COP9/ Overview/tabid/7528/ctl/Download/mid/22166/language/en-US/Default.aspx?id=4&ObjID=48022 (last visited May 28, 2020).

¹⁸ Inter- Ministerial Delegation to Participate in Basel, Rotterdam, Stockholm Conventions in Geneva: Three COPs to BRS Conventions to Discuss Management of Hazardous Waste, Chemicals and Organic Pollutants, PRESS INFORMATION BUREAU, https://pib.gov.in/newsite/PrintRelease.aspx?relid=161203 (last visited May 28, 2020).

²⁰ Database of Notifications of Final Regulatory Action, PRIOR INFORMED CONSENT OFFICIAL WEBSITE, http:// www.pic.int/Procedures/FinalRegulatoryActions/Database/tabid/1368/language/en-US/Default.aspx (last visited May 28, 2020).

Aldrin, Benzene Hexachloride, Benomyl, Calcium Cyanide, Carbaryl, Chlorobenzilate, Ethyl Mercury Chloride, Tridemorph, and Trichloro Acetic Acid, to name a few, and 6 pesticide formulations, have been banned in India. Moreover, 8 pesticides have been withdrawn and 18 pesticides have been refused registration in the country.²¹ Out of these, many pesticides are also banned under Annexure III of the Rotterdam Convention.

India has also banned a few pesticide formulations such as Carbofuron, Methomyl and Phosphamidon, and these are also banned for import and manufacture. On the other hand, Captafol Powder and Nicotin Sulfate are pesticide formulations that have been banned in India for purposes except manufacture for export and use within the country for dry seed treatment.²² Article 12 of the Convention states that any State Party that exports a banned or severely restricted chemical (definition of chemical under the Convention includes chemical formulations) would have to issue an export notification to the importing party, containing the information prescribed under Annexure V of the Rotterdam Convention.²³ Annexure V requires that the export notification has to contain information about names and addresses of the designated national authorities, the name and summary of the banned or severely restricted chemical being exported, information on precautionary measures, and any additional information that has to be furnished as per the guidelines of the designated national authorities of the exporting party.

CONFERENCE OF PARTIES AND INDIA

Article 18 of the Convention makes provisions for the establishment of the Conference of Parties (CoP). The CoP comprises of the governments representing the different parties that have accepted, ratified or acceded to the Rotterdam Convention, and functions as its governing body. The Convention is implemented through the decisions taken at the CoP meetings.²⁴ The primary role of the Conference of Parties is to oversee the implementation of the Convention, provide recommendations from

²¹ List of Pesticides which are Banned: Refused Registration and Restricted in Use, Directorate of Plant Protection, Quarantine and Storage, Government of India (29 February, 2020), http://ppqs.gov.in/sites/ default/files/banned_registricted_and_phased_out_29.02.2020.pdf.

²² Official Gazette Notification S.O. No. 1196(E) of 2020 dated 20 March 2020.

²³ United Nations, *supra* note 17.

²⁴ Overview of Conference of Parties, ROTTERDAM CONVENTION, http://www.pic.int/TheConvention/ ConferenceoftheParties/OverviewandMandate/tabid/1049/language/en-US/Default.aspx (last visited May 28, 2020).

time to time to ensure its effective implementation, to amend the Convention, and to add chemicals to Annex III from time to time. Till 2020, nine Conference of Parties have taken place. Although no significant developments with respect to India took place in the first two meetings of the Conference of Parties, in the third meeting, the Indian Government was selected along with the Chinese, Japanese and Sri Lankan Governments to designate an expert each to the Chemical Review Committee of the Asia Pacific, for a period of 4 years.²⁵ Similarly, nothing significant took place for India in the fourth meeting, but during the fifth meeting, the Indian Government was again selected along with the Kuwaiti, South Korean and Saudi Arabian Governments to designate an expert each to the Chemical Review Committee of the Asia Pacific.²⁶ The sixth meeting was significant for all the State Parties, and witnessed the participation of 1,400 participants, with the inclusion of one new pesticide called Azinphos-Methyl in Annexure III.²⁷ The Indian Government was selected along with the Sri Lankan, Tongan and Yemeni Governments to appoint a representative each to the Chemical Review Committee of the Asia Pacific, for the third time. The seventh meeting led to the inclusion of Methamidophos in Annexure III, the adoption of 15 decisions, and negotiations on compliance mechanisms for the Convention.²⁸ In the eighth meeting, India's representative specifically stated that efficacious implementation of the Rotterdam Convention was highly dependent upon the dissemination of appropriate and adequate technologies, supported by capacity building and technical assistance. This led to the establishment of a contact group for the purposes of technology transfer during the meeting.²⁹ The theme of the ninth meeting of the

²⁵ United Nations, Report of the Conference of Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in Inernational Trade on the work of its third meeting, UNEP/FAO/RC/COP.3/26 (2006), http://www.pic.int/TheConvention/ ConferenceoftheParties/Meetings/COP3/tabid/1112/language/en-US/Default.aspx.

²⁶ United Nations, Report of the Conference of Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its fifth meeting, UNEP/FAO/RC/COP.5/26 (2011), http://www.pic.int/TheConvention/ ConferenceoftheParties/Meetings/COP5/tabid/1400/language/en-US/Default.aspx.

²⁷ United Nations, Report of the Conference of Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its sixth meeting, UNEP/FAO/RC/COP.6/20 (2013), http://www.pic.int/TheConvention/ ConferenceoftheParties/Meetings/COP6/tabid/2908/language/en-US/Default.aspx.

²⁸ United Nations, Report of the Conference of Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its seventh meeting, UNEP/FAO/RC/COP.7/21 (2015), http://www.pic.int/TheConvention/ ConferenceoftheParties/Meetings/COP7/Overview/tabid/4252/language/en-US/Default.aspx.

²⁹ United Nations, Report of the Conference of Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its seventh meeting, UNEP/FAO/RC/COP.8/27 (2017), http://www.pic.int/TheConvention/ ConferenceoftheParties/Meetings/COP8/Overview/tabid/5311/language/en-US/Default.aspx.

Rotterdam Convention, which was jointly held with the CoP of the Basel Convention and the Stockholm Convention in Geneva, was *"Clean Planet, Healthy People: Sound Management of Chemicals and Waste"*.³⁰ It was extremely pertinent for the interests of India because its concerns regarding the potential dumping of electronic waste by the Global North nations were addressed and accepted by most of the other State Parties, which led to negotiations and corrections in the interim technical guidelines to the Basel Convention on electronic waste.³¹The significant developments of the ninth meeting, with specific reference to the Rotterdam Convention, included the addition of Phorate as a pesticide and Hexabromocyclododecane as an industrial chemical under Annexure III, and the adoption of Annexure VII, which lays down the procedures and mechanisms for compliance under Article 17³² of the Convention.³³

LAWS IN INDIA THAT IMPLEMENT THE PRINCIPLES OF THE ROTTERDAM CONVENTION

INSECTICIDES ACT, 1968

The Insecticides Act, 1968 aims to regulate the import, sale, manufacture, transport, use and distribution of insecticides, to confine and eliminate the risks and dangers of hazardous insecticides over human and animal health.³⁴ Although the term pesticide is not used in the text of the legislation, the term 'insecticide' is used to denote the same meaning. 'Insecticides' refers to substances specified in the Schedule appended to the Act, and includes fungicides and weedicides. A few of the authorities established and vested with responsibilities under the Act are the Central Insecticides Board, the Registration Committee, the Central Insecticides Laboratory, the Insecticide Analyst, the Insecticide Inspector, the licensing officer, the State Governments, and the Central Government.

³⁰ United Nations, Report of the Conference of Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its seventh meeting, UNEP/FAO/RC/COP.9/23 (2019), http://www.pic.int/TheConvention/ ConferenceoftheParties/Meetings/COP9/Overview/tabid/7528/language/en-US/Default.aspx.

³¹ India Sets the Tone at COP Meetings of Basel, Rotterdam and Stockholm Conventions held in Geneva, PRESS INFORMATION BUREAU (May 16, 2019), https://pib.gov.in/newsite/PrintRelease.aspx?relid=190019.

³² United Nations, *supra* note 17, art. 17 (The Conference of the Parties shall, as soon as practicable, develop and approve procedures and institutional mechanisms for determining non-compliance with the provisions of this Convention and for treatment of Parties found to be in noncompliance).

³³ United Nations, Report of the Conference of Parties to the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade on the work of its seventh meeting, UNEP/FAO/RC/COP.9/23 (2019), http://www.pic.int/TheConvention/ ConferenceoftheParties/Meetings/COP9/Overview/tabid/7528/language/en-US/Default.aspx.

³⁴ The Insecticides Act, 1968.

The Central Insecticides Board

The Central Insecticides Board is empowered to, and entrusted with: (a) advising the Central Government and State Governments in the administration of technical matters; (b) the exercise of functions that prevent risks to human beings and animals from insecticides; (c) to develop safety measures in that respect; and (d) to administer the manufacture, sale, transport, storage and distribution of insecticides, in order to ensure safety of human beings and animals.³⁵

Registration Committee

The Act provides for the establishment of a Registration Committee by the Central Government that has to undertake the registration of insecticides after (a) scrutinising and analysing the formulae of such insecticides, and (b) verifying the claims of importers and manufacturers regarding safety issues with respect to human beings and animals. The Registration Committee can provide either unconditional or conditional registration of insecticides under the Act, after the respective importer or manufacturer pays the requisite fees. Furthermore, if an insecticide is being introduced to India for the first time, the Registration Committee may also choose to only grant provisional registration for a period of two years, as a safety measure.³⁶

Licensing Officer

A person who manufactures or exhibits for sale or sells or distributes or stocks any insecticide, or undertakes any commercial pest control operations with such insecticide, has to apply to the licensing officer appointed by the respective State Government under Section 12 of the Act. Similar to the Registration Committee, the licensing officer can grant conditional or unconditional licenses after the payment of the fees as required. The licensing officer possesses the power to revoke, suspend or amend the license if it is found that the license holder has been contravening the conditions of the license, or has obtained the license through misrepresentation of an essential fact.

Prohibition

One of the pivotal provisions of the Act is Section 17, which prohibits the import and manufacture of misbranded insecticides, prohibited insecticides under Section 27,



³⁵ Id. § 4.

³⁶ Id. § 5.

any insecticide that contravenes the provisions of this Act and the Rules thereunder, and insecticides that do not comply with conditions of registration. Further, Section 18 restricts the sale, stock, exhibition, transportation, distribution or use of unregistered insecticides, prohibited insecticides under Section 27, and insecticides that contravene provisions of this Act and the Rules framed thereunder.

Section 27 empowers the Central Government to prohibit the sale, distribution or use of such insecticides as are likely to involve risk to human beings or animals. Under Section 26 of the Act, the State Government may require any person or class of persons, by notification in the Official Gazette, to report to any designated officers of the Government on occurrences of insecticide poisoning through the use or handling of such insecticides. Section 27, in continuation of this provision, requires the Central Government to prohibit the sale, distribution or use of such pesticides for a period not extending 60 days, during which the insecticide or batch of insecticides would be investigated upon. If the results of the investigation confirm that the insecticide is indeed harmful, the Central Government shall issue an order refusing to register the insecticide or cancelling the certificate of registration, if any, granted in respect of such insecticide.

Insecticides Inspector and Insecticides Analyst

The Act also provides for the appointment of Insecticide Inspectors³⁷ by the Central Government or the State Governments. Their powers include those to search and investigate, seize or require the production of documents and items, take samples, make inquiries, and prohibit the distribution, sale or use of an insecticide which is being distributed, sold or used in contravention of the provisions of the Act or the rules thereunder. The Insecticide Inspector is to act as per the Criminal Procedure Code, 1973 in discharging his powers.³⁸ Further, in order to ensure that the powers exercised by them are not exercised arbitrarily, specific procedures in respect of the manner of exercise of powers have also been stipulated by the Act under Section 22. An Insecticide Analyst appointed as per the provisions of this Act³⁹ has to examine the sample given by the Insecticide Inspector and on his/her report, the Inspector is empowered to take action accordingly.

³⁷ *Id.* § 20.

³⁸ Id. § 21.

³⁹ Id § 19.

Penalties

Section 27 of the Act enables the Central Government and the State Governments to prohibit insecticides for public safety reasons through Notifications, which would ultimately lead to the prohibition of sale, distribution, or use of such dangerous insecticides. Section 29 of the Act provides for penalties and offences, as reflected in the table below-

Offence	Penalty
Whoever imports, stocks, sells, manu- factures, exhibits for sale or distributes misbranded insecticides-	Imprisonment upto 2 years (first offence) or upto 3 years (subsequent offence) or fine not less than Rs. 10,000 but not more than Rs. 50,000 (first offence) or fine not less than Rs.15,000 but not more than Rs. 75,000 or both imprisonment and fine.
Whoever manufactures or imports any insecticide without a registration cer- tificate-	Imprisonment upto 2 years (first offence) or upto 3 years (subsequent offence) or fine not less than Rs. 10,000 but not more than Rs. 50,000 (first offence) or fine not less than Rs. 15,000 but not more than Rs. 75,000 or both imprisonment and fine.
Whoever manufactures, sells, exhibits for sale, stocks or distributes an insec- ticide without a license-	Imprisonment upto 2 years (first offence) or upto 3 years (subsequent offence) or fine not less than Rs. 10,000 but not more than Rs. 50,000 (first offence) or fine not less than Rs. 15,000 but not more than Rs. 75,000 or both imprisonment and fine.
Whoever causes the use of prohibited insecticide by any worker-	Imprisonment upto 2 years (first offence) or upto 3 years (subsequent offence) or fine not less than Rs. 10,000 but not more than Rs. 50,000 (first offence) or fine not less than Rs. 15,000 but not more than Rs. 75,000 or both imprisonment and fine.
Whoever sells or distributes insecti- cides prohibited under Section 27-	Imprisonment upto 2 years (first offence) or upto 3 years (subsequent offence) or fine not less than Rs. 10,000 but not more than Rs. 50,000 (first offence) or fine not less than Rs. 15,000 but not more than Rs. 75,000 or both imprisonment and fine.
Whoever obstructs an Insecticide In- spector in discharge of duties and pow- ers under the Act and its Rules-	Imprisonment upto 2 years (first offence) or upto 3 years (subsequent offence) or fine not less than Rs. 10,000 but not more than Rs. 50,000 (first offence) or fine not less than Rs. 15,000 but not more than Rs. 75,000 or both imprisonment and fine
Whoever uses an insecticide in viola- tion of the provisions of this Act and its Rules-	Imprisonment upto 6 months or fine not less than Rs.7500 but not more than Rs. 5,000 or both.

TABLE - 3

Whoever violates registration certifi- cate and license conditions of insecti- cides-	Imprisonment upto 1 year (first offence) or upto 2 years (subsequent offence) or fine not less than Rs. 5,000 but not more than Rs. 25,000 (first offence) or fine not less than Rs. 10,000 but not more than Rs. 50,000 (subse- quent offence) or both imprisonment and fine.
Subsequent offender under the Act and its Rules-	Offender's name, place of residence, offence and penalty imposed to be published in the newspapers directed by the Court.

INSECTICIDES RULES, 1971

The Insecticides Rules, 1971 have been prescribed by the Central Government in consultation with the Central Insecticides Board, in exercise of the powers conferred under Section 36 of the Insecticides Act, 1968.⁴⁰ The functions of the respective authorities established under the Act have been clearly laid down in the Rules. The procedures for application, grant and refusal of registration certificates and licensing of insecticides have also been prescribed under these Rules.

Procedures

Specific procedures have been provided for insecticides that have expired. It is provided that they have to be segregated from the batch of non-expired insecticides. Rule 10(1A) of the Rules provides that every applicant who applies for a license to undertake the sale, distribution, stockage, or exhibition for sale of insecticides under the Rules, has to employ a person who has graduated in Agricultural Sciences or in Botany or Zoology or in Science with Chemistry. All the retailers and dealers who already possess a valid license prior to the promulgation of such Rules have been granted three years to comply with the educational qualifications.⁴¹

It is mandatory for the expired insecticides to contain a stamp of "not for sale" or "not for manufacture" or "not for use". The disposal of such insecticides has to be done in an environment-friendly manner, as prescribed by the Board or the Central Government. The Rules also stipulate specific rules for insecticides containing sulphur and its formulations, by mandating that the license holder has to ensure that all precautions have been taken to prevent its theft. Despite such measures, if any theft occurs, it has to be reported promptly to the nearest Police Station. The license holder also has to maintain a separate register which contains the names and

⁴⁰ Insecticides Rules, 1971.

⁴¹ Insecticides (Amendment) Rules, 2019.

addresses of all the persons to whom insecticide sulphur has been sold or distributed, and details of the respective quantities. In order to ensure the safety of human beings and animals, Rule 10C specifically prohibits the manufacture, storage and exposure of insecticides in a building where articles consumed by animals and human beings are stored, kept for sale, or manufactured.

Packaging and Labelling

An important addition by these Rules is issuing guidelines for packaging and labelling. If any insecticide is put in a package, the Rules mandate the presumption of fitness for sale. Rule 18 provides that a leaflet containing the following details has to be present in the package of the insecticide:

- 1. Insects, plant diseases, weeds, and noxious animals against which the insecticide can be applied, and the instructions for use and other directions.
- 2. Details of chemicals present in the insecticide that are harmful to human beings, animals, and other wildlife, cautionary statements, warnings that include symptoms of poisoning, and safety measures which should be taken.
- 3. Cautionary statements regarding storage and details of inflammability, explosiveness, and other harms which can be caused to the skin.
- 4. Instructions for decontamination or safe disposal of the containers of such insecticides.
- 5. Detailed statement that shows the antidotes of the poison.
- 6. Statement on whether the insecticide causes irritation to the skin, nose, throat or eyes.
- 7. Common name of the insecticide as prescribed by the International Standards Organisation, but if a name has not been prescribed by the International Standards Organisation, the name is to be approved by the Registration Committee.

A detailed labelling procedure has also been provided for:

1. The insecticide must carry a label that cannot be removed ordinarily and contains the name of the manufacturer, the name of the insecticide including the brand name or trademark under which such insecticide is offered for sale, the registration number of the insecticide, the ingredients and percentage of each ingredient of the insecticide, the net content in terms of volume, the expiry date, the batch number and an antidote statement.



2. In 2019, an amendment to the Rules added certain requirements such as the printing of labels in English as well as in Hindi, label size being made co-relative to the size of the package, the mandate of stating the use of the insecticide such as agricultural use/household use/pest control use, and the inclusion of safety pictograms on the label which reflect the flammability, corrosiveness and other aspects.⁴²

Transport

Different procedures for packaging and storage have also been provided for different types of transportation of insecticides. Rule 45 specifically lays down the places at which the insecticides can be imported:

- 1. For insecticides imported by rail across the frontier with West Pakistan-Ferozepore Cantonment and Amritsar railway stations.
- 2. For insecticides imported by rail across the frontier with East Pakistan- Bongaon, Mahiassan and Ranaghat railway stations.
- 3. For insecticides imported by sea in India- Kolkata, Mumbai, Chennai, Cochin and Kandla ports.
- 4. For insecticides imported by air in India- Mumbai, Kolkata, Chennai, Delhi and Ahmedabad airports.

COMPARATIVE ANALYSIS OF THE INSECTICIDES ACT, 1968 AND INSECTICIDES RULES, 1971 WITH THE SALIENT PROVISIONS OF THE ROTTERDAM CONVENTION

At the outset, a comparison between the Insecticides Act, 1968, Insecticides Rules, 1971 and the Rotterdam Convention reveals that while the Rotterdam Convention deals with bans of pesticides, insecticides and chemicals that harm the environment, wildlife and human life,⁴³ the ambit of the Act and Rules in India only encompasses human beings and animals, with very little reference to the environment. Although the term "animals" is used in the Act and Rules, its parameters are wide enough to cover all wildlife.⁴⁴ A reference to the protection of the environment can be traced to the Rules, where the safe disposal of expired insecticides in an environmentally-

⁴⁴ The Insecticides Act, 1968, § 3(a).



⁴² Insecticides (Third Amendment) Rules, 2019.

⁴³ United Nations, *supra* note 17.

friendly manner has been mandated,⁴⁵ and for the safe disposal of packages, surplus materials and washing must be undertaken in a manner to prevent water pollution and environment destruction.⁴⁶ Another significant drawback of the Act and Rules is that many insecticides that have been banned by Annexure III of the Rotterdam Convention are still in use in India.⁴⁷

Penalty

The Insecticides Act, 1968 and the Rules framed thereunder have failed to acknowledge the gravity of the issue which the Rotterdam Convention has aimed to eradicate, and this is evident by the quantum of penalty which is prescribed. In the light of the fact that the damage caused due to hazardous insecticides to human beings, animals and environment can be significant, and in many cases, irreparable, the penalty levied for causing such harm is meagre.

Ambiguity, Export and Enforcement

The ambiguity of Section 38 is a cause for higher concern because it states that the Act does not apply to the use of insecticides for personal land cultivation, in kitchen gardens, or for household purposes. A pertinent question that arises is whether such exemption would also extend to banned insecticides. If the answer is in the affirmative, such a provision not only contravenes the spirit of the Rotterdam Convention and the State's goal of accommodating healthy human life and environment, but also defeats the purpose of imposing a ban in the first place. It is of utmost necessity that specific and different provisions for dealing with non-banned insecticides and banned insecticides exist, coupled with stringent penal mechanisms without loopholes for enforcing the ban on hazardous insecticides for non- agricultural purposes. Ultimately, the hazards of such insecticides affect human health, wildlife health and environmental health as a whole.

Although the Rotterdam Convention provides separate Articles for export notifications, and emphasises the importance of the procedure for the export of banned pesticides and insecticides to other nations by providing a detailed compliance mechanism, the Insecticides Act, 1968 and its Rules have completely failed to incorporate any

⁴⁵ Insecticides Rules, 1971, Rule 10A.

⁴⁶ Insecticides Rules, 1971, Rule 44.

⁴⁷ Insecticides/ Pesticides Registered under Section 9(3) of the Insecticides Act, 1968 for Use in the Country, Directorate of Plant Protection, Quarantine & Storage (March 31, 2020), http://ppqs.gov.in/sites/default/files/list_of_registered_pesticides.pdf.

provision on the export of insecticides that have been banned in India and also have also been banned under Annexure III of the Convention.

Although detailed procedures seem to exist in the Insecticides Rules, 1971, the uncertainties of enforcement faced in India, and the less than satisfactory performance of the officials concerned, have led to the failure of effective enforcement of the Act and Rules in line with the obligations enshrined in the Rotterdam Convention. This is evident in the insecticide poisoning (intentional and unintentional) faced by farmers in India, and in the continued use of DDT and carbosulfan.⁴⁸

The Supreme Court of India also pointed out the deficiencies in the Act in the year 1997, in the case of *Dr. Ashok* v. *Union of India & Ors*. It stated that once a substance is specified in the Schedule appended to the Act, there is no power conferred on authorities to cancel the registration certificate in respect of such substance even if a scientific study indicates that such insecticide is harmful for human health.⁴⁹ Furthermore, the Supreme Court of India, in *Democratic Youth Federation of India* v. *Union of India & Ors*,⁵⁰ banned the use of endosulfan in India in 2011⁵¹ after the failure of legislative prohibition, despite the fact that endosulfan is an Annexure III chemical under the Rotterdam Convention.

On the perusal of the propositions advanced in the above paragraphs, it is apparent that although India has ratified the Rotterdam Convention, it has failed in performing its obligations to form, implement, and enforce adequate domestic laws that can lead to sustainable adoption of insecticides in India without harming the environment, human health and wildlife. Although the judiciary has taken efforts to change such a situation, only efficacious legislative and executive efforts can help in eliminating the qualms faced by the Insecticides Act, 1968 and Insecticides Rules, 1971 that will enable the same to be in consonance with the Rotterdam Convention.

⁴⁸ T Bonvoisin et al., Suicide by Pesticide Poisoning in India: A Review of Pesticide Regulations and their Impact on Suicide Trends, BMC PUBLIC HEALTH (February 19, 2020), https://bmcpublichealth. biomedcentral.com/articles/10.1186/s12889-020-8339-z.

⁴⁹ Dr. Ashok v. Union of India &Ors., AIR (1997) SC 2298.

⁵⁰ Democratic Youth Federation of India v. Union of India & Ors, (2011) SCI (Civil) 213.

⁵¹ Id.

PESTICIDES PROHIBITION ORDER, 2018

The Central Government, in collaboration with the Ministry of Agriculture, established an Expert Committee on 8th July, 2013 to examine the use of the neo-nicotinoid pesticides that were registered in India.⁵² On 19th August, 2013, the mandate of the Expert Committee was enlarged, and it was entrusted with examining an additional 66 pesticides which have been banned, restricted or withdrawn in other countries but continued to be registered for use in India. The report of this Committee was submitted to the Central Government on 9th December, 2015. After this, the Central Government consulted the Registration Committee appointed under the Insecticides Act, 1968, and stipulated the ban of 18 pesticides.

The ban was imposed through notifying the Pesticides (Prohibition) Order, 2018 vide Notification No. S.O. 3951(E) dated 8th August, 2018. The Order clearly states that the banned pesticides have been notified under the Schedule appended to the Order, and that the manufacture, import, formulation, transportation, sale or use of all such pesticides is prohibited from 8th August, 2018. After the operation of this Order, the Registration Committee will have to call back all the registration certificates granted for the notified pesticides. There is also a provision that if any person who holds a registration certificate of such pesticide fails to return it back to the Registration Committee, such person will have to face the penal consequences specified under the Insecticides Act, 1968. The Order also states that the registration certificate granted under the Insecticides Act, 1968⁵³ will be automatically cancelled after the enactment of the Order. Since this Order is a piece of delegated legislation formed under Sections 27 and 28 of the Insecticides Act, 1968, the person not returning the registration certificate within the duration specified can be held liable for imprisonment upto 2 years or fine not less than Rs. 10,000 but not exceeding Rs. 50,000 in case of first offence, or imprisonment upto 3 years or fine not less than Rs. 15,000 but not exceeding Rs. 75,000 in case of subsequent offence.54

Comparative Table of the Schedule to the Pesticides (Prohibition) Order, 2018 and Annex III of the Rotterdam Convention

The Schedule of the Order, which bans 18 pesticides, has been specified below in a table, along with the details of whether the same are also banned under the Rotterdam Convention-

⁵² Pesticides (Prohibition) Order, 2018.

⁵³ The Insecticides Act, 1968, § 9.

⁵⁴ Id. § 29(1).
Sl. No.	Name of Pesticide	Details of Ban in India	Status of Ban under Annexure III Rotterdam Convention
1.	Benomyl	Completely Banned	Yes
2.	Carbaryl	Completely Banned	No
3.	Diazinon	Completely Banned	No
4.	Fenarimol	Completely Banned	No
5.	Fenthion	Completely Banned	No
6.	Linuron	Completely Banned	No
7.	Methoxy Ethyl or Mercury Chloride	Completely Banned	No
8.	Methyl Parathion	Completely Banned	Yes
9.	Sodium Cyanide	Completely Banned	No
10.	Thiometon	Completely Banned	No
11.	Tridemorph	Completely Banned	No
12.	Trifluralin	Registration, import, manufacture, formulation, transport or sale is prohibited, but its use in wheat is permitted. The use of this pesticide in wheat is subject to the condition that a cautionary statement has to be incorporated in the leaflet and label that this pesticide is toxic to marine life and therefore, should not be used near water bodies, pisciculture or aquaculture areas.	No
13.	Alachlor	After 08/08/2018, no new registrations have been permitted. The import, manufacture, and formulation were restricted after 01/01/2019, and complete phase out of the pesticide had to be achieved by 31/12/2020. It is mandatory to incorporate a cautionary statement in the label and leaflet of existing pesticides till the phase out lasts, which states that it is toxic to aquatic organisms and therefore, should not be used near water bodies, pisciculture and aquaculture areas	Yes

TABLE - 4

14.	Dichlorvos	After 08/08/2018, no new registrations were permitted. The import, manufacture, and formulation were restricted after 01/01/2019, and complete phase out of the pesticide has to be achieved by 31/12/2020. It is mandatory to incorporate a cautionary statement on the label and leaflet of existing pesticides till the phase out ends, which states that it is toxic to aquatic organisms and therefore, should not be used near water bodies, pisciculture and aquaculture areas. An additional warning should also be incorporated on the leaflet and label stating that this pesticide is toxic to honey bees and therefore, should not be sprayed during active honey bees foraging period.	No
15.	Phorate	After 08/08/2018 no new registrations were permitted. The import, manufacture and formulation were restricted after 01/01/2019, and complete phase out of the pesticide had to be achieved by 31/12/2020. It is mandatory to incorporate a cautionary statement in the label and leaflet of existing pesticides till the phase out ends, which states that it is toxic to aquatic organisms and therefore, should not be used near water bodies, pisciculture and aquaculture areas. An additional warning should also be incorporated in the leaflet and label stating that this pesticide is toxic to honey bees and therefore, this pesticide should not be sprayed during active honey bees foraging period. Another additional warning has to be incorporated in the leaflet and the label stating that this pesticide is toxic to birds.	Yes
16.	Phosphamidon	Same as above.	Yes
17.	Triazophos	Same as above.	No
18.	Trichlorfon	After 08/08/2018 no new registration was permitted. Import, manufacture and formulation were restricted after 01/01/2019 and complete phase out of the pesticide had to be achieved by 31/12/2020. It is mandatory to incorporate a cautionary statement in the label and leaflet of existing pesticides till the phase out which states that it is toxic to aquatic organisms and therefore, should not be used near water bodies, pisciculture and aquaculture areas. Another additional warning has to be incorporated in the leaflet and the label stating that this pesticide is toxic to birds.	Yes

Lacunae in the Pesticides (Prohibition) Order, 2018

Primarily, the Order suffers from inconsistencies in the choice of banned pesticides. The Expert Committee reviewed a total of 66 chemicals but only 18 pesticides were banned, even though many of the rest were considered highly hazardous in the Report.⁵⁵ A few pesticides were banned even though they were termed as "moderately hazardous", and many pesticides were ignored even though the Report clearly stated that such pesticides were "highly hazardous" as per World Health Organisation standards. Some of the remaining pesticides also find a place in Annexure III of the Rotterdam Convention and despite India's ratification of the Convention, a few Annexure III pesticides were ignored and not banned through the Order. A few of such pesticides have been listed below:

- 1. Methomyl was termed as a highly hazardous insecticide and harmful to honey bees, silkworms and fish. Presently, only 40% SP formulation of Methomyl is permitted in India. Methomyl, also referred to as Lannate, is also fatal if swallowed, and has long lasting hazards on the aquatic environment.⁵⁶ Despite this, it was not banned through the Order.
- 2. Monocrotophos was termed as a highly hazardous insecticide and is harmful to honey bees and birds. Monocrotophos has also been listed in Annexure III of the Rotterdam Convention.⁵⁷ Monocrotophos is fatal if swallowed, toxic if it comes in contact with skin, fatal if inhaled, capable of causing genetic defects, and extremely toxic for aquatic life and the aquatic environment.⁵⁸ Despite this, Monocrotophos is only banned for use on vegetables in India.
- 3. Thiram was termed as a moderately hazardous fungicide but is covered under Annexure III of the Rotterdam Convention, which avers that more than 15% of Thiram should not be used in dustable powder formations that are severely hazardous pesticide formulations.⁵⁹ Thiram is harmful if swallowed, causes skin

⁵⁵ Minutes of 361st Special Meeting of Registration Committee held on 22.12.2015 in Committee Room No. 1 Ground Floor, ICAR, Krishi Bhawan, New Delhi, DIRECTORATE OF PLANT PROTECTION, QUARANTINE AND STORAGE (Dec. 22, 2015), http://ppqs.gov.in/sites/default/files/361rc2015.pdf.

⁵⁶ *Lannate*, NATIONAL LIBRARY OF MEDICINE: NATIONAL CENTRE FOR BIOTECHNOLOGY INFORMATION (Mar. 25, 2005), https://pubchem.ncbi.nlm.nih.gov/compound/5353758.

⁵⁷ Annex III Chemicals, PRIOR INFORMED CONSENT OFFICIAL WEBSITE (2020), http://www.pic.int/ TheConvention/Chemicals/AnnexIIIChemicals.

⁵⁸ *Monocrotophos*, National Library of Medicine: National Centre for Biotechnology Information (Mar. 27, 2005), https://pubchem.ncbi.nlm.nih.gov/compound/5371562.

⁵⁹ *Thiram*, NATIONAL LIBRARY OF MEDICINE: NATIONAL CENTRE FOR BIOTECHNOLOGY INFORMATION (Mar. 25, 2005), https://pubchem.ncbi.nlm.nih.gov/compound/5455.

irritation and serious eye irritation, causes allergic skin reaction, is harmful if inhaled, damages human organs on repeated and prolonged exposure, and is extremely toxic to aquatic life and the aquatic environment.⁶⁰ Despite this, it was not banned by the Order.

4. Zinc Phosphide was termed as a highly hazardous insecticide. It is also referred to as Trizinc Diphosphide. It releases flammable gases which might ignite immediately on coming into contact with water, is fatal if swallowed, harms the skin, is extremely toxic to aquatic life, and has long term hazards for the aquatic environment.⁶¹ Despite this, it has not been banned by the Order.

Therefore, it would not be wrong to infer that despite the severe adverse effects of some pesticides as furnished in the paragraphs above, the Committee permitted their continued use disregarding the hazards to human health and the environment.

PESTICIDES MANAGEMENT BILL, 2020

The Pesticides Management Bill, 2020 intends to replace the Insecticides Act, 1968, and regulate the manufacture, packaging, import, labelling, storage, pricing, sale, advertisement, transport, use, distribution and disposal of pesticides, to ensure the availability of safe and effective pesticides.⁶² These activities have been regulated to minimise the risks to animals, human beings and living beings other than pests, and the environment. The Bill also intends to promote biological pesticides based on traditional knowledge, and related matters. It was placed before the Rajya Sabha on 23rd March, 2020.⁶³ However, no further progress has been made in this respect after the outbreak of the Coronavirus pandemic.

Some terms such as animals, environment, export, formulation, import, label, leaflet, manufacture, package, person, pest, pesticide, sale, stock, and worker have been defined under the Bill.⁶⁴ Clause 3(v) of the Bill defines 'pest' as any species, strain or biotype of plant, animal or pathogenic agent that is unwanted or injurious

⁶⁰ *Id*.

⁶¹ *TrizincDiphosphide*, National Library of Medicine: National Centre for Biotechnology Information (Sept. 16,2005), https://pubchem.ncbi.nlm.nih.gov/compound/4643716.

⁶² *Pesticides Management Bill 2020, Bill No. 22 of 2020*, PRS INDIA, https://www.prsindia.org/sites/ default/files/bill_files/Pesticide%20Management%20Bill%2C%202020.pdf (last visited May 28, 2020).

⁶³ *The Pesticide Management Bill, 2020*, PRS LEGISLATIVE RESEARCH (March 23, 2020), https://www.prsindia.org/billtrack/pesticide-management-bill-2020.

⁶⁴ Pesticides Management Bill, 2020, Bill No. 22 of 2020, § 3(a), (i), (j), (k) (l), (m), (n), (p), (t), (u), (v), (x), (zh), (zj) & (zl).

to plant, plant products, humans, animals, or other living creatures. The definition is broad enough to include vectors of parasites or pathogens of human and animal diseases, and vermins defined under the Wild Life (Protection) Act, 1972. 'Pesticide' has been defined as any substance or mixture of substances, including a formulation of chemical or biological origin, that is intended to prevent, destroy, attract, mitigate, repel or control any pest in agriculture, industry, pest control operation, public health, storage or ordinary use. It includes any substance intended for use as a plant growth regulator, desiccant, fruit thinning agent, sprouting inhibitor, or any substance applied to crops either before or after the harvest to protect them from deterioration during storage or transportation.⁶⁵ The word insecticide has been done away with and has been replaced by the word 'pesticide'. Further, the definition covers pesticides utilised not only in the agricultural sector but also in other sectors, such as industry and public health.

Clause 3(b) of the Bill defines "ban" as the prohibition of manufacture, sale, import, distribution and use of the molecular or formulation of a pesticide in order to protect the environment, human health and other living organisms. "Dispose" has been defined under Clause 3(g) as the process which isolates, destroys or neutralises pesticides and its packages, including incineration, biological treatment, or physico-chemical treatment. Clause 3(r) of the Bill defines "ordinary use pesticide" as referring to pesticides intended for use in households, offices and similar premises, and specifically excludes pesticides used in industries, pest control, agriculture, storage or public health. Clause 3(s) defines "other ingredients" as inert materials, emulsifying agents, dispersing agents, stabilisers, surfactants, wetting agents, perfumes, preservatives, colouring agents and other biologically inactive substances added in specific proportions to a pesticide, which is of technical grade, to make a formulation.

Authorities under the Bill

Similar to the Insecticides Act, 1968, the Bill provides for the constitution of a Central Pesticides Board and a Registration Committee by the Central Government.⁶⁶ The main functions of the Board would include advising the Central Government and the State Governments on technical and scientific matters which are the subject matter of the Bill; advising the Central Government to adopt best practices for pest control

⁶⁵ *Id.* § 3(x).

⁶⁶ Id. §§ 4, 9.

operators; providing the criteria for good manufacturing processes for manufacturers of pesticides; detailing the procedure for pesticide recall, the criterion for the disposal of pesticides, and their packages in an environment-friendly manner; laying down standards for the Central Pesticides Laboratory; deciding the criterion for the training and working conditions for workers, and advertisement standards for pesticides; framing model protocols for poisoning occurrences, including the specification of standard operating procedures for medical facilities; researching on development and the availability of safer alternatives to existing pesticides, agro-ecological practices, safety and toxicity of registered pesticides; monitoring pesticide residues, the global developments on pesticides, and reviewing the status of registration applications.⁶⁷

The Registration Committee shall be entrusted with the responsibility of making decisions on registration applications for pesticides; laying down specifications of conditions for registration certificates; undertaking periodical review of safety and efficacy of registered pesticides, and the amendments and cancellations of registration certificates; reviewing pesticide registrations on the reference of the Central Government or State Governments; the maintenance of the national register of pesticides; and notifying substances which have pesticide properties.⁶⁸

Registration of Pesticides and the Grant of License

Any person who wishes to import or manufacture pesticides for ordinary use, storage, agriculture, pest control operations, industrial use or public health use, has to apply for a registration certificate before the Registration Committee, by paying the required fees. If the applicant submits false information or misleading information or if the safety standards of the pesticide are not as claimed by the applicant, the Registration Committee can refuse registration by furnishing written reasons for the same. The Committee can review or suspend the registration certificates issued, and can also provide a conditional registration certificate. A provision in the Bill states that the pesticides registered under the Insecticides Act, 1968 will be deemed to be registered for a maximum period of 2 years, after which a new application will have to be made. The Bill states that any person who wishes to manufacture, distribute, sell, exhibit for sale, or stock pesticides, or undertake any type of pest control operations, has to make an application to the Licensing Officer for a license for that purpose. Such license, if granted, can also be conditional in nature.⁶⁹

⁶⁷ *Id.* § 8.

⁶⁸ *Id*.§ 14.

⁶⁹ *Id.* § 16, 17.

Pesticide Surveillance and Prohibition in Public Interest

The Bill contains provisions for the State Government to mandate a person or a class of persons to report instances of pesticide poisoning to the Government, so that appropriate action can be taken. Clause 35(2) of the Bill specifically empowers the Central Government or the State Government to prohibit the use, distribution, manufacture, sale, or storage of any pesticide, if the same is found capable of having adverse effects over human health, environment and other living organisms. However, such prohibition cannot exceed one year. After prohibition is imposed on the ground that the pesticide has adverse effects, the Registration Committee has to review the decision, and its decision has to be made public. A detailed procedure for pesticide analysis and the establishment and functioning of pesticide laboratories has also been provided under the Bill.

Offences and Punishments

TABLE - 5

Offence	Penalty
Obstruction of an officer exercising powers and discharging duties under the Bill	Fine not less than Rs. 25,000 but not exceeding Rs. 50,000.
Manufacturing, imports, distribution, sale, exhibit for sale, stocking or transportation of pesticides or undertaking pest control operations in violation of registration conditions specified by the Registration Committee or the conditions of license granted by the Licensing Officer	Fine not less than Rs. 50,000 but not exceeding Rs. 2 lakhs.
Export or import of any pesticide in contravention of the provisions specified in the Bill or of an international treaty, agreement or decision relating to pesticides	Imprisonment which may extend upto 2 years or fine not less than Rs. 5 lakhs but not exceeding Rs.20 lakhs or both.
Transportation or becoming a cause for transportation within the country, any pesticide which is registered in India for export, except directly between the manufacturing premises to the port of exit for which a license has been obtained	Imprisonment which may extend upto 2 years or fine not less than Rs. 5 lakhs but not exceeding Rs. 20 lakhs or both.
Distribution or sale or use of pesticide in India in pest control operations when such pesticide has been registered for export	Imprisonment which may extend upto 2 years or fine not less than Rs. 5 lakhs but not exceeding Rs. 20 lakhs or both.
Manufacture, import, sale, exhibit for sale, transport or stocking of a pesticide or its use in pest control operations with a pesticide that has not been registered under the Bill	Imprisonment which may extend upto 3 years or fine not less than Rs. 10 lakhs but not exceeding Rs. 40 lakhs or both.

Manufacture, import, sale, exhibit for sale, transport or stocking of a pesticide or its use in pest control operations without a valid license	Imprisonment which may extend upto 3 years or fine not less than Rs. 10 lakhs but not exceeding Rs.40 lakhs or both.
Deliberate or fraudulent misrepresentation of the composition, identity or source of pesticide in the course of manufacture, sale, import, distribution, exhibition for sale, stocking or while carrying out pest control operations-	Imprisonment which may extend upto 3 years or fine not less than Rs. 10 lakhs but not exceeding Rs. 40 lakhs or both.
Deceptive claims about the efficacy of a pesticide, false claims about the chemical composition of a pesticide, use of false registration number on the package or label of the pesticide, printing a different label of the pesticide from the one approved by the Registration Committee, altering the date of manufacture at the time of repacking or re-labelling or impersonation of another manufacturer or purporting to be a manufacturer which is non- existent, by label, package or other means-	Imprisonment which may extend upto 3 years or fine not less than Rs.10 lakhs but not exceeding Rs. 40 lakhs or both.
Manufacturing, imports, distribution, sale, exhibit for sale, stocking or undertaking pest control operations using a pesticide whose registration certificate has been suspended or cancelled or which has been banned by the Government under Section 22 or Section 35 of the Bill	Imprisonment which may extend upto 3 years or fine not less than Rs. 10 lakhs but not exceeding Rs. 40 lakhs or both.
Distribution, use or sale of pesticides prohibited by the Central Government or State Government under Section 35 of the Bill	Imprisonment which may extend upto 3 years or fine not less than Rs. 10 lakhs but not exceeding Rs. 40 lakhs or both.
Causing hurt to a person in contravention of the provisions of the Bill	Fine not exceeding Rs. 10 lakhs.
Causing grievous hurt to a person in contravention of the provisions of the Bill	Fine not less than Rs. 5 lakhs but not exceeding Rs. 15 lakhs.
Causing death of a person in contravention of the provisions of the Bill	Imprisonment which may extend upto 5 years or fine not less than Rs. 10 lakhs but not exceeding Rs. 50 lakhs or both.
Subsequent offender of any offence under the Bill	Not less than twice the fine imposed at the time of first conviction regardless of the maximum fine provided under the Bill.
Any offence under the Bill	Details of the court before which the proceedings took place, name and place of residence of offender and penalty imposed can be published in the newspapers when directed by the Court.

Comparative Analysis of the Pesticides Management Bill, 2020 and the Salient Provisions of the Rotterdam Convention

Penalties

In terms of ensuring appropriate adherence with the obligations of the Rotterdam Convention, the Pesticides Management Bill, 2020 operates with minimal deficiencies. The inadequacy of the Insecticides Act, 1968 had led to the introduction of this Bill. The Bill has significantly covered most of the aspects that are required to cure the defects of the Insecticides Act, 1968, including the establishment of a resilient penal mechanism. However, although such penalties are capable of affecting individuals and micro, small and medium enterprises, large scale corporations will continue to remain unaffected by such penalties. Therefore, it is very important that the penal structure for companies is separately prescribed.

Advertisement

In the Statement of Objects and Reasons of the Bill, it is specified that one of its purposes is to regulate advertisements. It is of utmost importance that the Bill prohibits advertisement of pesticides that are banned by the Rotterdam Convention and the pesticides that are classified as highly hazardous as per the World Health Organisation Classification. This is because many pesticides that are deemed as highly hazardous as per the World Health Organisation Classification, and those banned under Annexure III of the Rotterdam Convention, have not been banned in India. The incessant advertisement of such pesticides will only cause increased usage of the same, which would strongly be contrary to the Indian obligations under the Rotterdam Convention.

Exceptions to Penalties

Similar to the Insecticides Act, 1968, the Pesticides Management Bill, 2020 also provides for defences which any person can plead before a Court to escape liability. This is evident in Clause 54(2) of the Bill, which states that a person who is not an importer or manufacturer of a pesticide, or his agents, can escape the penal provisions of the Bill, if (a) such person or agent can show that the pesticide was acquired from a valid license holder for importing, manufacturing, stocking, sale or distribution of such pesticide, or (b) if such person did not diligently know that the pesticide received from a distributor or manufacturer is not of approved composition, or (c) if the pesticide, even if banned under the Bill, was in the person's possession and was properly stored and remained in the same state in which that person acquired it. Such lacunae would only pave the path to violation of the spirit of the provisions with legal impunity, and entail the severe consequences that are contrary to the aims of the Rotterdam Convention. In consideration of the fact that the impact of such pesticides on human health, living organisms, and the environment are severe, irreparable and irreversible, even if any exceptions are provided under the Bill, they must be limited to the pesticides that are not considered as highly or severely hazardous. If this is not ensured, in all likelihood the exceptions would be rampantly misused after the Bill comes into operation.

Labelling and Packaging Conditions

It is of utmost importance that the new Rules prescribed under the Bill or the amendment of the extant Rules, as the case may be, must be done in such a manner so as to ensure that special packaging and labelling conditions are prescribed for highly hazardous pesticides covered under the World Health Organisation's Classification, and for the pesticides banned by the Rotterdam Convention that have not been banned in India. Further, it should be mandated that the label contains the necessary details, such as ingredients and composition of the pesticides and instructions of use, in the local language(s) of the State(s) as well.

CONCLUSION

When the Insecticides Act, 1968 and the Insecticides Rules, 1971 were framed in India, the Rotterdam Convention had not been drafted. After India ratified the Rotterdam Convention in 2005, it entrusted three Ministries with the function of executing the provisions of the Convention, viz., the Ministry of Environment, Forest and Climate Change; the Ministry of Chemicals and Fertilizers; and the Ministry of Agriculture and Farmer's Welfare. The first regulatory action taken by India under this framework was to ban Benzidine and its salts. Since then, India has banned various chemicals that have been banned under Annexure III of the Rotterdam Convention, by way of notifications. India has also been selected multiple times to appoint an expert in the regional Chemical Review Committee. Further, its stand in the ninth meeting of the Conference of Parties was widely accepted by many nations.

The Insecticides Act was last amended in 2000, much before the ratification of the Rotterdam Convention. However, the Insecticides Rules, 1971 have been amended

from time to time, and a variety of amendments in the procedures under the Rules have been witnessed. It is undeniable that the provisions of the Pesticides Management Bill, 2020 are certainly much more conducive to human and environmental safety than those of the Insecticides Act, 1968, and that the Bill has bridged many deficiencies of the latter. However, the pesticide poisoning situation in India, and the increased use of highly hazardous pesticides, requires stringent compliance without lapses. Therefore, it is significant that the Bill limits the application of the exceptions, provides separate penalties for corporations, and restricts the advertisements of highly hazardous pesticides and Annexure III pesticides of the Rotterdam Convention. Hence, it should be expeditiously passed once its deficiencies are remedied.

Several hazardous pesticides banned under Annexure III of the Rotterdam Convention are yet to be banned in India. The Ministry of Agriculture and Farmer's Welfare has recently introduced the Draft Insecticides (Prohibition) Order, 2020⁷⁰ which has not been enacted yet, in pursuance of the Supreme Court's judgment in *Dr. Ashok* v. *Union of India & Ors*⁷¹. The Draft Order intends to ban Tricyclazole and Buprofezin in India. In addition to this, the Ministry of Agriculture and Farmer's Welfare also introduced the Draft Banning of Insecticides Order, 2020 on 14th May, 2020.⁷² The list of pesticides which would be banned after the implementation of the Order are as under:

1.	Acephate	2.	Atrazine	3.	Benfuracarb
4.	Butachlor	5.	Captan	6.	Carbendazim
7.	Carbofuran	8.	Chlorpyrifos or Chlorpyriphos 2, 4- D	9.	Deltamethrin
10.	Dicofol	11.	Dimethoate	12.	Dinocap
13.	Diuron	14.	Malathion	15.	Mancozeb
16.	Methomyl	17.	Monocrotophos	18.	Oxyfluorfen
19.	Pendimethalin	20.	Quinalphos	21.	Sulfosulfuron
22.	Thiodicarb	23.	Thiophanate Methyl	24.	Thiram
25.	Zineb	26.	Ziram		

TABLE -	6
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70 Draft Insecticides (Prohibition) Order, 2020, S.O. 531(E) (Notified on Jan. 31, 2020).

71 Dr. Ashok v. Union of India & Ors, AIR (1997) SC 2298.

72 Draft Banning of Insecticides Order, 2020, S.O. 1512(E) (Notified on May14, 2020).

Assessing Legal and Regulatory Framework in India that Governs Pesticides and Industrial Chemicals that Impact Health and Environment

On perusal of the above list, it is extremely clear that the Draft Order issued on 14th May, 2020 intends to ban all chemicals in India that are covered under the Rotterdam Convention, the World Health Organisation's Classification of Pesticides and the Verma Committee Report, which the Pesticides (Prohibition) Order, 2018 failed to undertake. Therefore, if implemented, this Order could be one of the most significant actions taken to implement the spirit of the Rotterdam Convention under Indian law.

CHAPTER 8

ROTTERDAM CONVENTION AND INTERNATIONAL CHEMICAL TRADE

INTRODUCTION

The Rotterdam Convention, which is the first in the line of defense against the import of toxic industrial chemicals and pesticides,¹ is in furtherance of the principle of ensuring that 'no one is left behind'. The Convention aims to protect those millions of farmers, workers, the general public, the 3.5 billion people who are predominantly dependent on the environment for livelihood, and the children whose vulnerability is the reason behind their exposure to toxic pesticides. The Netherlands hosted a Conference of Plenipotentiaries in Rotterdam, which witnessed the signing and adoption of the Convention. With the ratification of Convention by the 50th contracting party, i.e., Armenia, it assumed the status of Public International Law.²

Role of Rotterdam Convention in International Chemical Trade

The harmful impact of pesticides and chemicals on the non-target organisms such as soil micro-organisms justifies the incorporation of mitigation measures at the global level. This requirement was addressed in the Rotterdam Convention. Further, diminishing soil fertility, food insecurity, groundwater pollution, pollution of surface water, bio-accumulation of pesticides, deteriorating human health, harms caused to wildlife, and the destruction of the wildlife's habitat are some of the resultant outcomes of indiscriminate import, manufacture and use of poisonous chemicals. By referring to these calamitous effects, it can be inferred that such activities annul the progress made by the usage of chemicals and pesticides in the field of healthcare, food production, and telecommunications. However, the lack of a political consensus

¹ Basel, Rotterdam, Stockholm Conventions, UNITED NATIONS INSTITUTE FOR TRAINING AND RESEARCH, https://unitar.org/sustainable-development-goals/planet/our-portfolio/basel-rotterdam-stockholmconventions (last visited May 4, 2020).

² Background Information on the Rotterdam Convention (PIC Procedure), Federal Office of Consumer PROTECTION AND FOOD SAFETY, https://www.bvl.bund.de/EN/Tasks/04_Plant_protection_products/03_ Applicants/13_LegalRegulations/03_InternationalAgreements/02_PIC_Rotterdam/ppp_intern_ agreements_PIC_Background_node.html (last visited June 3, 2020).

during the listing of the chemicals under the Rotterdam Convention, even after the presentation of scientific evidence to support the claims made, has initiated arguments demanding the blacklisting of such chemicals. If a chemical is not listed under the Convention, it would continue to expose the developing countries, with their economies in transition, to great risks as they lack the ability and infrastructure to manage the risks from such chemicals.³

Chemical development has reached new highs in the medicinal, agricultural and commercial arenas. On the one hand, it has helped in accelerating economic growth and development. On the other hand, the everlasting and irreparable damage to the environment caused by the same has posed ethical dilemmas. The application of pesticides to consumer products and the usage of chemicals in industrial processes have impacts that are not limited to the intended areas of application or usage. Hence, the possibility of their traversing the intended boundaries and reaching the human system raises the severity of the issue. The urge to use pesticides to ensure food security on the one hand, and the awareness of the associated detrimental effects on the other, might result in conflicts. The ongoing debates have been intensified by the consideration of intergenerational ethics, which translates into the responsibility of the current generation to secure resource access for the future generations.⁴ Environmental injustice is experienced by the poorest communities in urban areas, whose economic conditions compel them to pursue occupations which would involve serious exposure to chemicals and waste. The adverse experience of poor communities in rural areas because of the usage of unauthorised chemicals has also made the global community contemplate the sound management of chemicals as a viable option. One such International Convention which has pressed the need for the formulation of sound management practices is explained in depth.⁵

Noting the absence of a regulatory framework in countries to monitor the import and use of chemicals, leading to the exposure of such countries to catastrophic events, the UNEP and FAO structured an adequate international infrastructure. The International

³ *Contributions to the 2030 Agenda for Sustainable Development*, SUSTAINABLE DEVELOPMENT GOALS KNOWLEDGE PLATFORM, https://sustainabledevelopment.un.org/content/documents/10239COP%20 Rotterdam%20Convention%20contribution%20recd%202016-May-9.pdf (last visited June 3, 2020).

⁴ Oxford Handbook of Public Heath Ethics, (Anna C. Mastroianni et al. eds., 2019).

⁵ *Chemicals and Waste Management*, UNITED NATIONS DEVELOPMENT PROGRAMME, CHEMICAL AND WASTE MANAGEMENT, https://www.undp.org/content/undp/en/home/2030-agenda-for-sustainable-develop ment/planet/environment-and-natural-capital/chemicals-and-waste-management.html (last visited May 17, 2020).

Code of Conduct on The Distribution and Use of Pesticides issued by the FAO, and the London Guidelines for the Exchange of Information on Chemicals in International Trade issued by the UNEP, laid the foundational stone for chemical management at the global level. These instruments constituted the initial efforts which culminated in the introduction of the voluntary prior informed consent procedure, and the further integration of this procedure into these international instruments. This was followed by the finalisation of the text of Convention on Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International trade,⁶ which came into force on 24th February, 2004.

The Convention has admitted to the imminent necessity of advancing technical assistance devising channels for cooperation among parties in order to facilitate information exchange and the dissemination of the decisions taken by the parties by deploying decision making process. In furtherance of the commitment to protect health and environment, the promotion and adoption of sound management practices is considered as a viable option. Under the purview of information exchange, it requires the parties to provide information on the legislative actions undertaken for banning or restricting the usage of chemicals in their territories, to inform other parties regarding the problems arising out of usage of severely hazardous pesticides in transitioning economies so that they could collectively decide on their listing in Annex 3 list, to provide information on the export of banned or severely restricted chemicals to importing parties, and to transmit the up-to-date data sheet to the importer.⁷

The labelling requirements laid down in the Convention indicate the legal protection available at the global level. While exporting the chemicals listed in Annex 3, there is a requirement of using codes and labels. Since the World Custom Organisation has developed the Harmonized Commodity Description and Coding system, notifying the custom codes assigned for the Annex 3 chemicals, there is a requirement of using the same in the shipping document. The exporting party, exporting either Annex 3 chemicals or chemicals subjected to bans or severe restrictions within its territory, must label the consignment in order to convey information to the importing party regarding the potential risks to human health and the environment. It is pertinent to

⁷ *Overview*, ROTTERDAM CONVENTION, http://www.pic.int/TheConvention/Overview/tabid/1044/language/ en-US/Default.aspx (last visited May 18, 2020).



⁶ *History of Rotterdam Convention*, EUROPEAN COMMISSION, https://ec.europa.eu/environment/chemicals/ trade_dangerous/rotterdam-convention/history_en.htm (last visited May 17, 2020).

note that such labels should be in accordance with the relevant international standards. In furtherance of the objective of information exchange, the Convention requires the parties engaged in the export of chemicals to incorporate information on the label in one or more of the official languages of the importing party.⁸ The Preamble of the Convention expressed the desire to ensure compliance with the amended London Guidelines and the International Code of Conduct while labelling the chemicals, with an intention of protecting the human and environmental health.⁹ While the previous Chapter dealt with the salient features of the Convention with special reference to its applicability to international trade of industrial chemicals and pesticides. These, and other important aspects of the labelling requirement under the Convention, will be discussed in this Chapter.

LABELLING REQUIREMENTS UNDER THE ROTTERDAM CONVENTION: THE INTERNATIONAL CODE OF CONDUCT

Article 10 of the International Code of Conduct extensively addresses the international labelling requirements. As per the Code, all pesticide containers should be labelled in accordance with the relevant regulations, or the GHS (Globally Harmonized System of Classification and Labelling of Chemicals), or FAO/WHO guidelines on good labelling practice for pesticides. While using the labels, the pesticides industry should comply with the registration requirements and include recommendations consistent with those of the relevant authorities in the country of sale. Some pieces of information which must be featured on the labels of pesticides are: appropriate symbols, pictograms along with the signal words or hazard and risk phrases, written instructions, warnings and precautions in appropriate languages, information regarding compliance with national/international labelling standards, instructions in the proper language, warnings against the decanting and reusing of containers, information on release date, expiry dates and storage stability, instructions for the safe disposal of used containers, etc.¹⁰

⁸ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade art. 13, Sept. 10, 1998, 38 ILM (1999)[hereinafter 'Rotterdam Convention 1998'].

⁹ Id.

¹⁰ The International Code of Conduct on Pesticide Management, art. 10, FOOD AND AGRICULTURAL ORGANISATION, http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/Code_ENG_2017updated.pdf (last visited Sept. 19, 2020).

The London Guidelines for the Exchange of Information on Chemicals in International Trade

The London Guidelines, which are in accordance with the Rotterdam Convention, refer to labelling while listing the elements which must be present in the national legal frameworks on chemical management. While indicating the need to tailor and shape the Convention to local conditions, it emphasized the importance of having clear labels specifying the hazards of usage of the chemicals and their proper usage. Given that the Convention has not included punitive measures, as per the Guidelines, States can empower Designated National Authorities to verify, with the assistance of custom officials, whether the exporters have adhered to the labelling requirements. In the case of non-compliance, the Designated National Authorities can be authorised via domestic legislations to take action against the perpetrators. The scope and nature of liability, available remedies, penalties, and provisions for reviewing or preferring appeals against the actions of authorities are some of the areas with which a national legislation has to deal.¹¹

The Guidelines on Good Labelling Practices for Pesticides

The International Code of Conduct, mentioned in the Preamble, in turn makes a reference to the 'Guidelines on Good Labelling Practice for Pesticide'. Hence, it becomes imperative to understand this International instrument. The fact that in many instances, labels might be the only source of information for the end user, makes their significance evident.¹² Clear, accurate,¹³ complete, and comprehensive¹⁴ labels have a higher probability of bringing the attention of the users to the instructions. Some other prerequisites for an adequate label are durability, the inclusion of information in the local language, presentation through informative pictograms, and the inclusion of symbols and colour bands. Product content information including information on the name of the chemical, type of formulation, active ingredient name, active ingredient content, name and concentration of hazardous co-formulants, net

¹¹ *Guide on Development of National Laws to Implement Rotterdam Convention*, ROTTERDAM CONVENTION, www.pic.int/Portals/5/ResourceKit/B_Guidance%20information/Legal%20guide/legalguide-eng.pdf (last visited May 3, 2020).

¹² *Guidelines on Good Practices for Pesticides*, WORLD HEALTH ORGANISATION, https://www.who.int/whopes/ resources/9789241509688/en/ (last visited Sept. 19, 2020) [hereinafter Guidelines on Good Practices for Pesticides].

¹³ *Id.* § 1.6.

¹⁴ *Id.* § 1.7.

contents, batch and registration,¹⁵ is a required constituent of the label. Further, the label should include hazard and safety information, which encompasses hazard symbols, signal words, hazard statements, precautionary statement, precautionary pictograms, hazard colour brands, tactile warning for the blind and visually impaired, first aid and medical advice¹⁶, directions for use¹⁷ and supplier identification,¹⁸ The prescribed layout,¹⁹ style and the format of the text²⁰ (with preference to statements which encourage beneficial behaviour are mandatory/ advisory in nature) should further contribute to the ease of reading. The usage of colours as per the GHS (Globally Harmonized System of Classification and Labelling of Chemicals), to warn the user regarding the hazardous nature of the pesticide, is yet another requirement.²¹

The Harmonized System Code for Product Coding

The Harmonized System Code is a universal product coding mechanism which is administered by the World Custom Organisation (WCO) so that custom authorities all over the world can identify the goods/substances inside the freight. The Harmonized System is governed by the International Convention on the Harmonized Commodity Description and Coding System, which was adopted in June 1983 and entered into force in January 1988.²² It provides for a six-digit code which is allotted to every product according to the international custom standard for the classification of goods. The system comprises about 5,000 commodity groups, each identified by a six-digit code and arranged in a legal and logical structure, and is supported by well-defined rules to achieve uniform classification. The commodity groups are structured into 21 Sections (Sections I to XXI), 97 Chapters (1 - 97), four-digit headings and six-digit sub-headings. Chapters 98 and 99 are for national use only.²³ The Harmonized System is based on a hierarchy of Sections, Chapters and Headings.²⁴ The codes serve

- 16 Id. §3.2.
- 17 Id. § 3.3.
- 18 *Id.* § 3.4.
- 19 *Id.* § 4.1.
- 20 *Id.* § 4.2.
- 21 Id. § 4.3.

- 23 Classification of Goods and Compliance Requirements in India International Trade, THOMAS REUTERS TAX AND ACCOUNTING, https://tax.thomsonreuters.com/blog/classification-of-goods-and-compliancerequirements-in-india-international-trade/ (last visited May 29, 2020).
- 24 The International Convention on the Harmonized Commodity Description and Coding System, 1503 U.N.T.S. 168.

¹⁵ *Id.* § 3.1.

²² *Harmonized Systems (HS) Convention*, TRADE FACILITATION IMPLEMENTATION GUIDE, http://tfig.unece.org/ contents/HS-convention.htm (last visited May 29, 2020).

various purposes, and are widely used by private sector organisations, governments and other organisations internationally for purposes including the monitoring of controlled goods, formulation of trade policies, gathering statistics of transports, etc. Therefore, this system is a language used by parties in international trade for facilitating a universal coordination.

As of today, 212 countries, territories and customs or economic unions have adopted the Harmonized System.²⁵ For goods and commodities to be exported to a country, they have to be assigned an HS code so that they are accountable, trackable and follow the Harmonized Tariff System. There are 6 digits assigned to a commodity by the WCO, which no country is allowed to alter. However, the countries can add further digits for the more effective identification of the commodity.²⁶ The HS Committee updates the system with the necessary amendments every 5-6 years. The currently enforced edition of the HS Code is the one that was adopted in 2017, and next amendment is meant to take effect from 2022.

Structure of the Harmonized System

The Harmonized System comprises:

- General Rules for the interpretation of the Harmonized System;
- Section and Chapter Notes, including Subheading Notes;
- A list of headings arranged in a systematic order and, where appropriate, subdivided into subheadings.

For the purposes of tariff classification, the Harmonized System provides a legal and logical structure within which a total of 1,222 headings (HS 2017) are grouped in 96 Chapters, the latter being themselves arranged in 21 Sections. Each heading of the System is identified by a 4-digit code (column titled "Heading"), the first two digits of which indicate the Chapter concerned, and the latter two digits indicate the position of the heading in the Chapter. For example, Heading 21.05 ("Ice cream and other edible ice, whether or not containing cocoa") is the fifth heading in Chapter 21 which,

²⁵ *List of 212 countries, territories or customs or economic unions applying the Harmonized System*, WORLD CUSTOMS ORGANISATION, http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/nomenclature/ overview/hs-contracting-parties/list-of-countries/countries_applying_hs.pdf?db=web (last visited May 29, 2020).

²⁶ Classification of Goods and Compliance Requirements in India International Trade, THOMSON REUTERS TAX AND ACCOUNTING, https://tax.thomsonreuters.com/blog/classification-of-goods-and-compliancerequirements-in-india-international-trade/ (last visited May 29, 2020).

in its entirety, covers "Miscellaneous Edible Preparations". Most of the headings are subdivided into 5-digit (one-dash) and 6-digit (two-dash) subheadings.

Section VI deals with 'Products of the chemical or allied industries', and contains Chapters 28 and 29 providing for 'Separate chemically defined compounds generally are dealt with in inorganic and organic chemicals'. The Harmonized System, therefore, is marked by a coherent set of headings and subheadings which, together with the General Interpretative Rules and Section, Chapter and Subheading Notes, provide for the systematic and uniform classification of goods.²⁷

THE INDIAN TRADE CLARIFICATION SYSTEM CODE

India has added 2 more digits to the already assigned HS Code for every item traded internationally, making the code an eight-digit number. Therefore, it is known as the Indian Trade Clarification (Harmonized System) ("ITC-HS"). The system provides for 2 schedules for classification–Schedule I, which describes the rules and guidelines related to import policies, and Schedule II, which describes the rules and regulations related to export policies.²⁸ India's export-import affairs are regulated by the Directorate General of Foreign Trade, and its duties include the issuance of license of certain goods to which an ITC-HS number has not been assigned.

There are 21 sections in Schedule I of the ITC-HS code, which are further sub-divided into chapters. There are a total of 98 chapters in Schedule I, which are further divided into sub-headings under which different HS codes are mentioned. Similarly, the Export Policy under Schedule II of the ITC-HS Code contains 97 chapters.

The First (Imports) Schedule and the Second (Exports) Schedule are organized as Sections, Chapters and Sub-chapters, which are provided for reference only.

• The eight-digit EXIM Code of an item comprises of the code of the chapter as the first two digits, the code of the heading as the next two digits, the fifth and sixth digits being the code of the sub-heading, and another two digits being provided as per India's common classification system. On division, in the eight-digit code, six are provided by the World Customs Organisation

²⁷ The Harmonized System (1988-2018)-A universal language for international trade, WORLD CUSTOMS ORGANISATION, http://www.wcoomd.org/-/media/wco/public/global/pdf/topics/nomenclature/activities -and-programmes/30-years-hs/hs-compendium.pdf?la=en (last visited May 29, 2020).

²⁸ *ITC HS Code List or India Harmonized Code System Code*,DGFT, https://www.dgft.org/itc_hs_code. html (last visited May 29, 2020).

(WCO) and are internationally uniform. The rest of the digits are assigned by the respective countries as 'item description', in accordance with their EXIM policies. Each Chapter contains a number of rows, and each row is divided into six columns;

- Tariff Item (HS) Code This is an eight-digit code followed in Schedule 1 Import Policy, Customs and the DGCIS code. The ITC-HS code numbers in Schedule 2 (Export Policy) are illustrative of the classification, but do not limit the description by virtue of the standard description of the item against the code in the Import Schedule of the ITC-HS Classification.
- Unit –This part of the code provides the measurement of the item, and is useful for shipping and other documents. Generally, the unit is signified as 'u'.
- Item Description The item description against each code gives the specific description of the goods which are subject to export control. This description does not generally correspond with the standard description mentioned against the code.
- Export or Import Policy This part provides information about the current export or import policy status of the item, with each item falling under the category of Prohibited, Restricted, State Trading Enterprise, or Free.
- Policy Conditions This notifies if there are any special conditions to be met for the item to be exported or imported. The intention of incorporating this column is to make the Export and Import Schedules self-contained and user friendly.²⁹

The ITC HS also classifies goods into four categories for the purposes of import and export– Prohibited, Restricted, STE and Free.³⁰

Prohibited – The substances that are recognized by the Government of India as too harmful to be allowed even on a restricted and supervised basis. When a substance which is regarded as prohibited is exported or imported, it exposes one to penalties under the customs laws of India. It is defined under Section 2(33) of the Customs Act, 1962 as "*any goods the import or export of which is subject to any prohibition*

²⁹ *ITC (HS), 2018, Schedule 2 – Export Policy*, Directorate General of Foreign Trade, Ministry of Commerce & Industry, https://dgft.gov.in/sites/default/files/read_2.pdf (last visited May 29, 2020).

³⁰ *Explanatory Note for Row and Column Description of Schedule -2 Export Policy*, DIRECTORATE GENERAL OF FOREIGN TRADE, MINISTRY OF COMMERCE & INDUSTRY, https://dgft.gov.in/sites/default/files/read_2.pdf (last visited May 29, 2020); *See also* Explanatory Note for Row and Column Description of this Schedule, https://dgft.gov.in/sites/default/files/read_0.pdf (last visited May 29, 2020).

under the Customs Act or any other law for the time being in force." Section 112 of the Customs Act, 1962 provides for penalties for improper import, and Section 114 provides for penalties for attempts to export goods improperly. In respect of prohibited goods, the Adjudicating Officer may impose penalties upto five times the value of the goods. It is, therefore, absolutely necessary for the trader to know what are the prohibitions or restrictions in force, before they contemplate importing or exporting any goods.³¹

Restricted - Any goods, the export or import of which is restricted under the ITC-HS, may be exported or imported only in accordance with the license/certificate/ permission/public notice issued in this behalf. The substances which have the potential to cause harm when used in a particular form or manner are generally prohibited from being used in that manner. Every exporter or importer shall comply with the provisions of the Foreign Trade (Development and Regulation) Act, 1992, the Rules and Orders made thereunder, the provisions of this Policy, the terms and conditions of any license/certificate/permission granted to him, and the provisions of any other law for the time being in force. All imported goods shall also be subject to domestic Laws, Rules, Orders, Regulations, and technical specifications and environmental and safety norms as applicable to domestically produced goods.³² Therefore, under the regulation requirements, the exporter/importer has to gain licenses on providing the licensing body (the DGFT in most cases) the intended purpose of the use of the goods concerned. The penalty for non-conformity with the instructions and procedures of Indian customs is provided for under the Customs Act, 1962 and other allied acts.

State Trading Enterprise– State Trading Enterprises (STEs) are governmental and non-governmental enterprises, including marketing boards, which deal with goods for export and/or import. Any good, the import or export of which is marked by an exclusive or special privilege granted to a State Trading Enterprise (STE), may be imported or exported by the concerned STE in compliance with the conditions specified in ITC–HS.³³ Article XVII of the GATT, 1994 is the principal provision dealing with state trading enterprises and their operations.³⁴

³¹ *Chapter 8 - Import/Export Restrictions and Prohibitions*, IEPORT.COM, http://ieport.com/Customs_manual/customs-manual-2012(8).PDF (last visited May 29, 2020).

³² Chapter 2 – General Provisions Regarding Exports and Imports, DIRECTORATE GENERAL OF FOREIGN TRADE, MINISTRY OF COMMERCE &INDUSTRY, http://dgftcom.nic.in/exim/2000/policy/chap-02.htm (last visited May 29, 2020).

³³ Id.

³⁴ *Technical Information on State Trading Enterprises*, WORLD TRADE ORGANISATION, https://www.wto.org/english/tratop_e/statra_e/statra_info_e.htm (last visited June 2, 2020).

'Free' denotes all goods which may be exported without any restrictions, except to the extent that such exports are regulated by ITC-HS, other provisions of the Foreign Trade Policy, or any other law for the time being in force. The DGFT may, however, specify through a public notice the terms and conditions according to which any goods, not included in ITC-HS may be exported without an authorization.³⁵

The chemicals listed in Annex III of the Rotterdam Convention, as per the import policy, are covered by Chapters 25,³⁶ 27,³⁷ 28,³⁸ 29,³⁹ and 38⁴⁰ of ITC-HS Import Policy.⁴¹ All forms of asbestos are allowed on the condition of the importer obtaining a certificate of origin from the Directorate General of Foreign Trade, Ministry of Commerce and Industry. This is essential since asbestos has been advocated against as one of the deadliest naturally occurring carcinogens. PCBs and PCTs are allowed for import under the general conditions.

The preceding sections of the Chapter discussed a very significant aspect of the Rotterdam Convention i.e. the labelling requirements. The following sections will discuss other such significant aspects.

ROTTERDAM CONVENTION AND THE PRIOR INFORMED CONSENT PROCEDURE

The use of the HS Code of the chemicals in Annex III of the Rotterdam Convention is to facilitate the implementation and enforcement of the Prior Informed Consent procedure. Article 13 of the Rotterdam Convention specifically mentions that after a code has been allotted to a chemical listed in Annex III, the exporter is under the obligation to include the code in the shipping documents of the chemical. Furthermore, the information on the risks and hazards that the severely hazardous

³⁵ Foreign Trade Policy 2015 – 2020, MINISTRY OF COMMERCE & INDUSTRY, DEPARTMENT OF COMMERCE, GOVERNMENT OF INDIA, https://dgft.gov.in/sites/default/files/ft17-051217.pdf (last visited June 2, 2020).

³⁶ *Chapter 25 Salt; Sulphur; Earths And Stone; Plastering Materials, Lime And Cement, ITC (HS), 2017,* DIRECTORATE GENERAL OF FOREIGN TRADE, https://dgft.gov.in/sites/default/files/chap25_0.pdf.

³⁷ *Chapter 26 Ores, Slag and Ash, ITC (HS),2017*, DIRECTORATE GENERAL OF FOREIGN TRADE, http://dgftcom. nic.in/exim/2000/itchs2017/chap26.pdf.

³⁸ *Chapter 28 Products of the Chemical or Allied Industry*, DIRECTORATE GENERAL OF FOREIGN TRADE, https://dgft.gov.in/sites/default/files/Chapter%2028.pdf (last visited June 2, 2020).

³⁹ *Chapter 29 Organic Chemicals, ITC (HS), 2017*, DIRECTORATE GENERAL OF FOREIGN TRADE, http://dgft.gov. in/sites/default/files/Chapter%2029.pdf.

⁴⁰ Chapter 38 Miscellaneous Chemical Products, ITC (HS), 2017, DIRECTORATE GENERAL OF FOREIGN TRADE, https://dgft.gov.in/sites/default/files/chap38.pdf.

⁴¹ *Chapter 28 Products of The Chemical or Allied Industries, ITC (HS), 2017*, DIRECTORATE GENERAL OF FOREIGN TRADE, https://dgft.gov.in/sites/default/files/Chapter%2028.pdf.

or banned substance poses to humans and the environment also to be included in the safety data sheet, as required by Clause 4 of Article 13 of the Convention, so that the importing party has complete knowledge of the product being imported. Both the label and the safety data sheet are to be provided in more than one official language of the receiving country.⁴²

The Prior Informed Consent procedure is a system that provides for the dissemination of information by the parties before importing or exporting chemicals and pesticides listed in Annex III of the Convention.⁴³ Article 7 deals with the Decision Guidance Document (DGD), and states that after a detailed scrutiny of a chemical by the Chemical Review Committee, it shall prepare a DGD based on Annexures I and IV when necessary and forward the same, along with recommendations, to the Conference of Parties. The Conference discusses and decides whether the chemical concerned should be subjected to the PIC procedure. If the answer is in the affirmative, the Secretariat prepares the documents and sends the same to all the member parties of the Convention for seeking a Final Regulatory Action on the particular chemical or the group of chemicals from the member parties, under Clause 3 of Article 7. The Final Regulatory Action (FRA), defined under Article 2(e), is the final decision/action taken by a party on whether to ban or severely restrict a chemical. Article 5 stipulates a time limit of 90 days for notifying the secretariat about the Final Regulatory Action adopted by the country concerned while following the requisite procedure as required by the Convention. The Convention, however, does not provide for a penalty or adverse consequence for the non-submission of the Notification of Final Regulatory Action (NFRA) within 90 days. For India, the Department of Chemicals and Petrochemicals is the Designated National Authority (DNA) for industrial chemicals, and Department of Agriculture and Co-operation is the DNA for pesticides.

IMPORT RESPONSE UNDER THE CONVENTION

Import Responses by parties are responses communicating their decisions, negative or positive, regarding the import of a chemical listed under Annex III of the Convention. The Secretariat biannually publishes a circular notifying all the responses it has received from the parties. The Parties, through their respective Designated National Authorities established under Article 4, are obligated to transmit their prompt stances

⁴² *Database of Import Responses*, UNITED NATIONS ROTTERDAM CONVENTION, http://www.pic.int/Procedures/ ImportResponses/Database/tabid/1370/language/en-US/Default.aspx (last visited May 26, 2020).

⁴³ *Guidance to Designated National Authority on the Operation of the Rotterdam Convention*, Food And Agricultural Organisation, http://www.fao.org/3/y5423e/y5423e02.htm (last visited May 26, 2020).

on a chemical, and if the party is not able to do so under any circumstances, it must do so within 9 months of receipt of the DGD sent to them by the Secretariat under Clause 2 of Article 10.⁴⁴

There are 2 kinds of responses that a party can transmit to the Secretariat. One is the interim import response and the other is the final response. When a party requires more time to reach a conclusive decision on importing a chemical, the DNA of that party invokes Article 5 (*interim response*) of the Import Response Form and sends the response under the same to the Secretariat. India communicated an interim response consenting to the import DDT and HCH (mixed isomers) in December, 1993. A party may change its decision on that chemical in the future with a fresh import response. Under Clause 4(b)(i) of Article 10, the party must assure the Secretariat that a final decision is underway, and on the need for assistance to evaluate the chemical, may request for the same.

On the other hand, a *final response* is the conclusive decision that a party, through its respective DNA, sends under Article 4 of the Import Response Form. As the name suggests, no subsequent changes can be made to the decision that has already been transmitted regarding the chemical concerned. India communicated its final response to consent to the import of Dieldrin and EDB (1,2-dibromoethane), which shall be used in the prescribed restricted manner, in December, 1993. Clause 6 of Article 10 mandates that the administrative or legislative measure, which is based on the Final Decision, shall also be included as a supporting document of the decision. India has formulated various legislations in alignment with the Rotterdam Convention: The Pesticides (Prohibition) Order, 2018, the Insecticides Act, 1968, the Insecticides Rules, 1971, and the Environment Protection Act, 1986.

It is the duty of the Secretariat to inform all the member parties, through a circular, of all the responses received. Since the primary objective of this mechanism is to gain the consent of all the parties to the Convention on the import of chemicals included in Annex III, it is an obligation of the exporting party to refrain from exporting the chemical to such a party which has not sent its response on that chemical as required by Clause 2 of Article 11.⁴⁵

⁴⁴ *Database of Import Responses*, UNITED NATIONS ROTTERDAM CONVENTION, http://www.pic.int/Procedures/ ImportResponses/Database/tabid/1370/language/en-US/Default.aspx (last visited May 26, 2020).

⁴⁵ Rotterdam Convention Text and Annexes on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 2244 U.N.T.S. 337.

TABLE – 1: The following table gives the restrictions on imports of chemicals resulting from the Rotterdam Convention:

Chemical/ Pesticide	Import Decisions of	Conditions imposed
Aldrin	No consent to import	Pesticides banned for Manufacture, Import and use
Aldecarb	No consent to import	Pesticides banned for Manufacture, Import and use (vide S.O. 682 (E) dated 17 th July, 2001)
Azinophos methyl	No consent to import	Refused Registration
Binapacryl	No consent to import	Pesticide in order to be imported has to be registered under the Insecticides Act. This pesticide is denied registration
2,4,5-T	No consent to import	Refused registration
Alachlor	Consent to import subject to specified conditions	Alcahlor is to be phased out vide S.O. 3951 (E). The import, manufacture, formulate of Alachlor shall not be allowed after 1 st January 2019. After 30 th December 2020, a complete ban shall be observed.
		The expert committee with the UN Rotterdam Convention had decided its inclusion into the PIC procedure. Alachlor which was used as a weed killer in soybean, weed and cotton production, is to be phased out, because of its toxic impact on the aquatic organisms. ⁴⁶
Captafol	Consent to import subject to conditions.	Use of Captafol as foliar spray was banned, while permitting its use as seed dresser vide (S.O.569 (E) dated 25 th July, 1989) ⁴⁷
		The manufacture of Captafol 80% powder for dry seed treatment (DS) is banned for use in the country except manufacture for export. (S.O.679 (E) dated 17 th July, 2001)
Chlordane	No consent to import	Banned for manufacture, use and import
Chlordimeform	No consent to import	No application for registration
Monocrotophos	Consent to import	Banned for use in vegetables
	only subject to specific conditions	S.O.1482 (E) dated 10 th Oct, 2005)

⁴⁶ *Alachhor, Aldicarb Blacklisted*, INDIAN ENVIRONMENTAL PORTAL, http://www.indiaenvironmentportal.org. in/content/247746/alachlor-aldicarb-blacklisted/ (last visited May 17, 2020).

⁴⁷ List of Pesticides Which Are Banned, Refused Registration and Restricted In Use SO 569(E),dt. 25-07-1989, DIRECTORATE OF AGRICULTURE, GOVERNMENT OF GUJARAT, https://dag.gujarat.gov.in/images/ directorofagriculture/pdf/Insecticide-Rules-1971.pdf (last visited Sept. 19, 2020).

DDT	Consent to import	The use of DDT for the domestic Public Health
		Programme is restricted up to 10,000 Metric
		Tonnes per annum. In accordance with the
		Stockholm Convention, the import to parties and non-parties shall be regulated. (S.O.295 (E) dated 8th March, 2006)
		Warranting the use of DDT for plant protection work, government can purchase as Insecticides.
Endosulfan	No consent to import	Vide ad-interim order of the Supreme Court of India in the Writ Petition (Civil) No. 213 of 2011 dated 13th May, 2011 and finally disposed off dated 10th January, 2017
Heptachlor	No consent to import	Pesticide Banned
Lindane	No consent to import	Import, use, manufacture of Pesticide banned
Pentachlorophenol	No consent to import	Ban on Import, use and Manufacture
Toxaphene	No consent to import	Ban on Import, use and Manufacture
		(vide S.O. 569 (E) dated 25 th July 1989)
Methyl Paranthion	Consent to import	Ban on import, use and manufacture (vide S.O 3951(E) dated 8 th August, 2018)
Phosphamidon	No consent to import	Pesticide formulations banned for import, use and manufacture

A detailed comparative table reflecting the pesticides and industrial chemicals banned under Annex III of the Rotterdam Convention and the Indian law has been added in the **Annexure** to this Part. The table reflects the *status of ban or registration refusal in India* for all the chemicals, *the date of ban in India* for the concerned chemical, the *details of restrictions*, the *applicable domestic law*, and the *impact of the chemical on health and environment*.

Import and Export of Pesticides: Indian Perspective

Pesticide	2018-19 (Unit M.T. Tech. Grade)	Import ⁴⁸	Export ⁴⁹	Name of the Country related with Import or Export ⁵⁰
Cypermethrin	5 (Import) and 13,609 (Export)	Yes	Yes	Brazil, Thailand, China, Vietnam and Mexico
DDT	8 (Import) and 151 (Export)	Yes	Yes	China, Zimbabwe, South Africa, Brazil and Nepal
DDVP	1,561 (Import) and 689 (Export)	Yes	Yes	Uganda, Japan, Mexico, Tanzania and Brazil
Thiram	522 (Import) and 169 (Export)	Yes	Yes	Nepal, Bangladesh, Malaysia, Australia and Sri Lanka
Dichlorophenoxy Acetic Acid and its Esters	2,819 (Import) and 22,242 (Export)	Yes	Yes	Australia, United States of America, Germany and United Kingdom
Copper Oxychloride	0.04 (Import) and 806 (Export)	Yes	Yes	Iran, Egypt, Pakistan, Vietnam and Lebanon
Isoproturon	3	Yes	No	Netherlands
Aluminium Phosphide	5 (Import) and 481 (Export)	Yes	Yes	Bangladesh, Turkey, Taiwan, Egypt and Ethiopia
Methyl Bromide	2 (Import) and 2,208 (Export)	Yes	Yes	Vietnam, Australia, Egypt, New Zealand and El Salvador
Gibberellic Acid	239 (Import) and 5 (Export)	Yes	Yes	Germany, Switzerland and United Kingdom
Plant Growth Regulators	13,410 (Import) and 2,154 (Export)	Yes	Yes	Germany, China, Vietnam, Spain and France
Disinfectants	3,088 (Import) and 16,171 (Export)	Yes	Yes	Sri Lanka, United Arab Emirates, Oman, United States of America and Zimbabwe
Allethrin	4	No	Yes	Iran, United States of America, Venezuela and Vietnam
Dimethoate	126	No	Yes	Tunisia, Nepal, Bangladesh, Madagascar and South Africa
Malathion	2,499	No	Yes	Saudi Arabia, Turkey, Mexico, Egypt and Malaysia

TABLE - 2

48 State-Wise Consumption of Pesticides, supra note 6.

49 Id.

⁵⁰ *Chemical and Petrochemical Statistics At a Glance- 2018*, DEPARTMENT OF CHEMICALS AND PETRO-CHEMICALS, https://chemicals.nic.in/sites/default/files/Chemical%20and%20Petrochemical%20Statistics%20 at%20a%20glance%20_2018.pdf (last visited May 28, 2020);See also SEAIR, https://www.seair.co.in (last visited May 28, 2020).

Quinalphos	281	No	Yes	Vietnam, Bangladesh, Tanzania, Nepal and Saudi Arabia
Synthetic Pyrethrum	0.15 (Import) and 2,066 (Export)	Yes	Yes	Vietnam, Pakistan, Australia, South Africa and Taiwan
Maneb	4,943	No	Yes	Morocco, Cameroon, Indonesia, South Africa and Sri Lanka
Sodium Penta Chlorophenate	874	No	Yes	Ecuador, Ghana, Mozambique, Oman and Venezuela
Zineb	31	No	Yes	Netherlands, Bangladesh, Malaysia, Vietnam and United Kingdom
Other Insecticides	17,189 (Import) and 62,724 (Export)	Yes	Yes	Brazil, Bangladesh, United States of America, Iran and Vietnam
Other Fungicides	7,738 (Import) and 1,85,896 (Export)	Yes	Yes	Brazil, Bangladesh, Indonesia, France and United States of America
Other Herbicides	18,044 (Import) and 74,058 (Export)	Yes	Yes	Israel, United States of America, Argentina, Brazil and France
Weedicides and Weed Killing Agents	1,344 (Import) and 7,028 (Export)	Yes	Yes	Brazil, United States of America, Nigeria, Nepal and Vietnam

IMPLICATIONS OF THE ROTTERDAM CONVENTION ON INDIAN TRADE

The discussion till this point has focused on certain significant aspects of the regulatory framework under the Rotterdam Convention. This Section, illustrates how India's actions at global meetings have limited the actual positive implications of the framework. It further discusses how aspects of the Rotterdam Convention have been incorporated into Indian laws.

Paraquat Dichloride

Paraquat Dichloride is a herbicide used to control broad-leaved weeds and grasses. It is quick-acting and non-selective in nature, and is reported to have destroyed green plant tissues on coming into contact. In humans, ingested paraquat gets distributed throughout the body, and gets accumulated in the lungs in high concentrations, resulting in pulmonary edema and lung damage. The study conducted in West Bengal investigated the claims of three retailers selling 10 different brands, who claimed that they had licenses permitting the sale, stocking, exhibition, and sale of pesticides. The claim of one retailer, who was selling seven brands, was verified. Out of the 7 brands, four of them were being sold without the authorisation of the manufacturers (Gramo and Kattar of Canary Agrochemicals, Gramoxone of Syngenta and Milquat of Insecticides India). All the ten brands failed to give an adequate warning

specifying the requirement of using Personal Protective Equipment. The absence of precautionary warnings in local languages in products of all the brands, and two brands recommending usage beyond the permissible levels specified by the CIB&RC, made it relevant for India to reconsider its stand on the Paraquat. Decanting and selling pesticides in the bags, and refilling bottles in contravention of Rule 16 of the Insecticide Rules, 1971, has been a common sight in India. The retail points were neither selling the required PPE, nor collecting back the containers, which has raised safety concerns.⁵¹ Examining the unauthorized import of Paraquat Dichloride, the Registration Committee decided to conduct an investigation of M/s Ganpati Agro Chemicals.⁵² The ignorance of farmers and failed implementation which is evident from the abovementioned fact regarding the imports, has exacerbated the matter in hand.

Trade name	Manufacturer			
Allquit	Crystal Crop Protection			
Ginny	Anu Products Limited			
Gramo	Canary Agrochemicals			
Gramoxone	Sygenta			
Kapiq	KrishiRasayan			
Katar	Canary Agrochemicals			
Milquat	Insecticide India			
Spyker	Advance Pesticides			
Tagquit	Tropical Agro Systems			
Uniquat	United Phosphorous			

TABLE - 3: Some of the Prominent Manufacturers of Agrochemicals

Under Article 6 of the Convention, Burkina Faso reported the application of Gamoxone Super with little or no personal protective equipment. Within a few hours of such usage, farmers reported symptoms of headache, excessive sweating, itching, tingling, burning of the skin, skin rashes and sores, complete destruction of contaminated areas, fever, dizziness, bone pain, loss of consciousness, breathing difficulties, cough, vision troubles, eye pain, ringing in the ears, abdominal pain, nausea, vomiting and lockjaw. Out of the cases reported, 15 of the farmers were not aware of the treatment, hence remained untreated. In 26 cases, the treatment was

⁵¹ Dileep Kumar A D, Paraquat Dichloride Retailing in India: A Case Study from West Bengal A sequel to 'Conditions of Paraquat Use in India', PAN-INDIA, http://www.pan-india.org/wp-content/uploads/2017/04/Paraquat-retainiling-in-India_PAN-India-04.2017.pdf (last visited Sept. 19, 2020).

⁵² *Minutes of 398th Meeting of Registration Committee held on 25.03.2019*, DIRECTORATE OF PLANT PROTECTION QUARANTINE AND STORAGE, http://www.ppqs.gov.in/sites/default/files/398_rc_minutes.pdf (last visited May 18, 2020).

administered and in 11 cases, they were hospitalised, considering the severity of their exposure. Similar chemical pesticide poisoning incidents reported in Senegal, Niger, Costa Rica, Chile, El Salvador, were cited. Through the citation of such statistics, the Chemicals Review Committee presented the rationale for the recommendation of the inclusion of Paraquat Dichloride in the list of Annex 3.⁵³ The proposal was backed by the recommendations of the CRC, and the consensus of 154 parties. The required consensus was blocked by India and Guatemala. Such a stand by India has brought the focus on the conditions of Paraquat use in India.⁵⁴ Further, this instance has revealed the shortcomings of the legal provisions in the framework which empower a few states to block the listing. These provisions have hence emerged as a major obstacle in ensuring the compliance of the countries. Further, the government's failure to engage in information exchange has come at the cost of a safer environment.

It is interesting to note that in the 361st Special Meeting of Registration Committee held on 22nd December, 2015, the use of Paraquat Dichloride was recommended to be continued. The Committee had taken note of the fact that the moderately hazardous herbicides have been banned in five countries (including the EU)and restricted in 9 countries. The application of this herbicide was observed to have had transient impacts on the microbial populations. Though the misuse of the chemical was reported by the R B Singh Committee,⁵⁵and even after the CRC recommending the inclusion of Praquat, with the recommendation being backed by 154 countries, the stand taken by India in this regard both at global and national levels indicates a lack of political will. It can be concluded that the Rotterdam Convention and the incidents reported by the parties have been ignored while arriving at a decision.

Asbestos

The Chemical Review Committee, while considering the final regulatory action forwarded by the European Community to ban Chrysotile Asbestos, and perusing the notifications forwarded by Australia and Chile, concluded that these propositions

⁵³ *Excerpt of the Report of CRC7 (UNEP/FAO/RC/CRC 7/15)*, ROTTERDAM CONVENTION, http://www.pic.int/ TheConvention/Chemicals/Recommendedforlisting/Paraquatdichloride/tabid/2396/language/en-US/ Default.aspx (last visited May 18, 2020).

⁵⁴ India, Indonesia and Guatemala Block the Listing of a Highly Hazardous Paraquat Formulation and Deprive Other Countries of Their Right to InformationPESTICIDE ACTION NETWORK INTERNATIONAL, http://pan-international.org/release/india-indonesia-and-guatemala-block-the-listing-of-a-highly-hazardous-paraquat-formulation-and-deprive-other-countries-of-their-right-to-information/ (last visited May 18, 2020).

⁵⁵ Minutes of 361st Special Meeting of Registration Committee held on 22.12.2015, DIRECTORATE OF PLANT PROTECTION QUARANTINE AND STORAGE, http://ppqs.gov.in/sites/default/files/361rc2015.pdf (last visited May 18, 2020).

were based on risk evaluation of the use of asbestos and the carcinogenic risk of chrysotile asbestos was also taken note of. Australia further brought the attention of CRC to the fact that exposure could cause excessive risk of asbestosis, lung cancer and mesothelioma. Avoiding human health risk was the rationale for the Committee's recommendation for the inclusion of chrysotile asbestos to the prior informed consent procedure.⁵⁶ One might get exposed to asbestos through inhaling the fibres, or by coming in contact with contaminated air, or through the inhalation of the ambient air in the vicinity of the source. There are several cases of people suffering from asbestos related diseases, inspite of getting exposed to only low levels of the same. Hence, the WHO, on considering the severity of the issue, averred that stopping the use of asbestos was the most efficient solution to eliminate the diseases. Given the decreasing trend in the usage of most forms of asbestos across the globe, and countries opting for a ban on asbestos, chrysotile is still widely used. The global evidence states that those exposed to asbestos might contract chronic respiratory problems. The reason behind the WHO considering the present issue as a major health concern lies in the fact that there is a long latent period of about 40 years between the exposure and diagnosis of mesothelioma. In the recent past, the majority of 154 parties to the Rotterdam Convention were in favour of the inclusion of Chrysotile under the Annex 3 list. A group of countries, including India, blocked such an inclusion. The following statistics further illustrate the grave negative implication of such a decision. As per the 2015 statistics, approximately 100,000 workers in both the organised and unorganised sectors were exposed to asbestos directly, and 30 million construction workers were estimated to be subjected to asbestos dust on a daily basis. The increasing consumption of chrysotile between 2000 and 2010, from 145,000t in 2000 to 462,000t in 2010, was documented.⁵⁷ By referring to the inventory of Hazardous Chemicals imports in India, the industries involved in the trading of this Chrysotile Asbestos fibre can be enlisted- Matrix Laboratories Limited and Sri Venkateshwara Pipes Limited.⁵⁸

⁵⁸ Inventory of Hazardous Chemicals Import in India, Indian Environmental Portal, http://www. indiaenvironmentportal.org.in/files/hazardous.pdf (last visited May 18, 2020).



⁵⁶ *Excerpt of the CRC1 report- Crysotile asbestos*, ROTTERDAM CONVENTION, http://www.pic.int/LaConvention/ Produitschimiques/Recommandéspourinscription/Amiantechrysotile/tabid/1871/language/fr-CH/ Default.aspx (last visited May 18, 2020).

⁵⁷ *Chrysotile Asbestos*, World Health Organisation, https://www.who.int/ipcs/assessment/public_health/ chrysotile_asbestos_summary.pdf (last visited May 18, 2020).

IMPLEMENTATION OF ROTTERDAM CONVENTION IN INDIA

In India, concerns were raised regarding the usage of globally banned pesticides in the production and cultivation of crops, fruits and vegetables, because of the adverse impact of the chemicals on human health, livestock and soils. The Government's response was the specification of a careful evaluator mechanism to assess the possible risk to environmental, animal and human health before the registration of the pesticide. Technical reviews are undertaken by an Expert Committee to ensure the safety of pesticides, and according to the result of the review, the decision to continue their use or to ban the same are taken.⁵⁹ Considering the failure of the Expert Committee constituted under Anupam Verma to assess the risks associated with Paraquat, and its ignorance of the recommendation of the CRC, providing for the pre-registration review involving stakeholders can be considered as one of the viable options.

Post-registration review was recommended in the Guide on the Development of National Laws to Implement the Rotterdam Convention. The Guide is intended to guide officials in charge of drafting and legislating on the Chemical and waste management to ensure the effective implementation of the Convention, and lists the possible actions that could be incorporated in the national laws. It recognises transparency and civil society participation as the key elements of effective policy-making. If adequate opportunities are provided to stakeholders, interested members of the public, and the civil society, informed decisions and responsible goals would be achieved.⁶⁰ The DNAs' participation in the review process would ensure compliance.

As recommended in the Guide, the promotion of non-regulatory actions can be considered as the way forward. The promotion of the alternatives to the pesticides, which pose lesser harm to the environment, is one of the actions which would further ensure sound chemical management as per International Code of Conduct on Pesticide Management.⁶¹ The central sector scheme, the Strengthening and Modernization of Pest Management Approach in India, which was floated by the Central Government,

⁵⁹ *Pesticides Health*, ENVIS – NIOH, http://www.niohenvis.nic.in/statistics_page/pes_hea_loksabha_ que.html# (last visited May 18, 2020).

⁶⁰ *Guide on Development of National Laws to Implement Rotterdam Convention*, ROTTERDAM CONVENTION, www.pic.int/Portals/5/ResourceKit/B_Guidance%20information/Legal%20guide/legalguide-eng.pdf (last visited May 18, 2020).

⁶¹ *International Code of Conduct on Pesticide Management*, FOOD AND AGRICULTURAL ORGANISATION, http://www.fao.org/agriculture/crops/thematic-sitemap/theme/pests/code/en/ (last visited May 18, 2020).

provides for an environmental-friendly approach to pest managements. This programme envisions a shift from the chemical pesticides to cultural, mechanical and biological pesticides. By establishing 31 Central Integrated Pest Management Centres, and by undertaking training programmes to create awareness among farmers, efforts are made to realise the mission of protecting planetary and human health from the vicious link of hazardous chemicals and waste. A detailed emergency plan to combat the emerging pests, the establishment of pest diagnostic units to facilitate early detection, and provision of Data Management cum Pest Forecasting Units are some of the components of the guidelines.⁶²

REGIONAL IMPLEMENTATION IN OTHER JURISDICTIONS AND THE **R**OTTERDAM CONVENTION GUIDELINES

The common feature among the Basel, Rotterdam and Stockholm Conventions is their objective to secure human beings and the environment from the disastrous effects of hazardous chemicals. The international trade of chemicals and wastes forms the subject matter of Rotterdam and Stockholm Conventions. These Conventions have the effect of restricting or banning the production of chemicals, thus striking at the root cause of the problem. When these chemicals transform into waste, the Basel Convention regulates their transboundary movement. The prevailing convergence facilitated the promotion of cooperation and coordination among the Conventions. This arrangement would be of help to those countries which are parties to various Conventions, and would support this harmonisation in the hope of enhanced cooperation. Designating National Focal Points/ Official Contacts would be the starting point of such arrangements. Thus, this synergic process is one of the arrangements devised to ensure implementation.⁶³This section examines the experiences of other countries in the implementation of the Rotterdam Convention, to gain insights into their experiences and the best practices adopted by them.

⁶³ International Trade Control Measures under The Basel, Rotterdam and Stockholm Conventions, BASEL CONVENTION, www.basel.int/Portals/4/...CHW-LEAFLET-PUB-IntlTradeControl.Eng (last visited May 4, 2020).



⁶² Norms/Guidelines for, "Strengthening and Modernisation of Pest Management Approach in India", DEPARTMENT OF AGRICULTURE, COOPERATION AND FARMERS WELFARE, http://www.agricoop.nic.in/sites/default/files/SMPMA%20guidelines.pdf (last visited May 18, 2020).

Jamaica

Jamaica, by integrating custom officials and DNAs in the process of implementation of the Convention, has set an example for the implementation of the Customs-related aspects of the Convention. The Ministry of Health, through its Pharmaceutical division, is in charge of the approval of import permits authorising the import of all chemicals except pesticides. It is in collaboration with the custom officials at all ports that a permit and licensing system has been developed. The Pesticide Act, 1975 mandates obtaining license prior to manufacturing or importing pesticides. The registration and licensing of pesticides are functions to be discharged by the Pesticide Control Authority, which has been established under the Act. The procedure followed while registering pesticides, which serves as a screening process, provides a lesson for other countries to successfully implement the Convention. For getting the pesticide registered, there are certain pre-requisites. These include the literature laying down the characteristics of the pesticide to be traded, sample copies of labels, certificates of analysis, duly authenticated and legalized certificates, statements listing the countries other than the country of origin, where the product is registered for free sale, statement conveyed by the manufacturer specifying the safety of new pesticides, required conditions of use and recommended conditions for sale, a copy of the Material Safety Data Sheet listing the pests covered, and certificates authenticated by the Jamaican Consulate. Once the pesticide is registered, one can apply for a license to import. The Customs officials trained by Pesticide Control Authority are deployed at various ports and post offices. In case of a failure on the part of the importer to produce the license, custom officials shall direct them back to the Pesticide Control Authority. The authority, with the assistance of the police officials, shall penalise the perpetrators. A Register of Pesticides, maintained by the Pesticide Control Authority, enables the administrative system of Jamaica to implement the obligations conferred under the Convention. The Online Notification used in this regard sends online applications for permit to the Pesticide Control Authority and the Pharmaceutical Division. This online process includes the engagement of Customs officials. Whenever importer makes an application for the grant of an import permit containing the Harmonised System Code as provided under the Convention, a notification in this regard will be forwarded to the Pesticide Control Authority. It is pertinent to note that the Pesticide Control Authority has been made in charge of ensuring the implementation of Rotterdam Convention. In accordance with the Convention, the import and export of the listed chemicals has been prohibited.⁶⁴

Nicaragua

The Ministry of Health, Ministry of Agriculture and Forest, and the Ministry of Environment and Natural Resources are the designated authorities of the country, and have assumed the responsibility of promoting alternatives to the Severely Hazardous Pesticide Formulations predominantly used in the country with the special consideration of the usage of Endosulfan. The toxicity of Endosulfan, and its potential to cause environmental pollution and degradation, did not serve as a barrier disincentivizing the farmers of Nicaragua from spraying this deadly pesticide on their fields. As a part of the programme to implement the Convention, 33 Farmers Field Schools were set up. In addition to these, 5 demonstration plots were set up in places like Matagalpa and Jinotega, regions where higher use of agrochemicals was recorded. These demonstration plots were set up in order to prove how effectively biological and chemical products could replace the usage of Endosulfan. The functions of Committee in Nicaragua were to review the agrochemical formulations in accordance with the standards laid down in the country's Environmental Law, and Annex 3 of the Convention. The resulting outcome is an example that has been set for signatories through the ban on Endosulfan and Aldicarb, the placement of restrictions on Terbufos Registration, and the inclusion of a proviso to update information regarding poisoning cases.⁶⁵

Regional Collaboration in West Africa

The Regional collaboration in West Africa was a successful initiative which resulted in the development of improved pesticide registration and the import control. In 2005, collaboration between the CILSS (Comité permanent Inter-Etats de Luttecontre la Sécheressedans le Sahel) member states and the Rotterdam Convention was initiated, which garnered the support of partners such as the CSP and the DNAs for the implementation of Rotterdam Convention. The technical assistance extended by the Secretariat of Rotterdam Convention played a vital role in the maintenance

⁶⁴ Case Study on The Customs- Related Aspects of The Rotterdam Convention Jamaica's Experience, ROTTERDAM CONVENTION, www.pic.int/Portals/5/secEdoc/Case%20study%20Jamaica.pdf (last visited June 3, 2020).

⁶⁵ Implementation of the Rotterdam Convention in Nicaragua, Dominican Republic, Colombia and El Salvador, FOOD AND AGRICULTURE ORGANISATION, http://www.fao.org/agriculture/crops/news-events-bulletins/detail/zh/item/213936/icode/?no_cache=1 (last visited June 3, 2020).
and continuation of the collaboration. On the one hand, pesticide registration at the regional level was conducted by the Sahelian Pesticide Committee (CSP). On the other hand, the DNAs took in charge of the import decisions. The authorities also assumed the responsibility of notifying the decisions of the Sahelian Pesticide Committee to the Secretariat. Such a regional approach prompted the implementation of the Rotterdam Convention. This regional organisation was initially brought into existence as a Permanent Interstates Committee for Drought Control in the Sahel, known as the CILSS. In the year of its inception, it consisted of 13 countries in West Africa. Further, in order to take measures to achieve its commitment for achieving food security, the Sahelian Pesticide Committee (CSP) was constituted to establish an improved pesticide registration system after bringing the expertise in pesticide evaluation and management of these member states together.

The statistics clearly point to the progress made subsequent to the adoption of the regional approach. In 2005, none of the CILSS member states had banned pesticides, except for the bans imposed by four of the nine countries at the national level. The change witnessed in 2017 is indeed appreciable. The data show that by mid-2017, 12 out of 13 member states had submitted 121 regulatory actions banning or imposing restrictions on the usage and trade of pesticides. A significant rise in the number of import decisions expressing the countries' refusal to import was witnessed between 2005 and 2017.⁶⁶

Costa Rica

Illegal trafficking and trade in hazardous chemicals and wastes, technology and know-how transfers, and information generation and access have been recognised as areas where the possibility of promoting collaboration can be explored. Costa Rica's success story in ensuring synergy provides us with the best practices. The country provided for the constitution of a support group for the competent authorities and the focal points of various Conventions, namely, the Technical Secretariat for the Coordination of Chemical Substance Management in 2006, with the objective of achieving sound chemical management at the national level. It undertook the incorporation of the Harmonized Custom Codes for the chemicals listed under the Rotterdam Convention, the Stockholm Convention and the Montreal Protocol. The

⁶⁶ Implementing the Rotterdam Convention Through Regional Collaboration in West Africa The Example of The Permanent Interstates Committee for Drought Control in The Sahel (CILSS), FOOD AND AGRICULTURE ORGANISATION, http://www.pic.int/Default.aspx?tabid=6251 (last visited June 3, 2020).

assistance of Customs service to the Technical Secretariat played an important role in reaching this benchmark.

The Republic of Korea

The Republic of Korea made changes to the statutes to reach the conceived objectives. The amendment to the Toxic Chemicals Control Act, followed by the classification and identification of certain chemicals originally listed under Rotterdam and Stockholm Convention as prohibited and restricted items, constituted the crux of the reforms. Further, the procedure providing for prior notifications for the export of substances is another strategy adopted by the Republic of Korea.⁶⁷

LACUNAE IN THE ROTTERDAM CONVENTION FRAMEWORK WITH EXAMPLES FROM THE INDIAN EXPERIENCE

The freeze of discussions on the failure on the part of the Parties to the Convention to arrive at a political consensus has been identified as a major blockage to the efficacy of the same. The clarion call for remedying this obstruction was made, by either allowing voting or by permitting amendments to the decision-making process for listing the chemicals in Annex 3. However, this proposal was countered by yet another group of members, who cited legal uncertainty as the reason for their oppositions. The Report of the Working Group on Enhancing the Effectiveness of The Rotterdam Convention on the Work of its first Meeting made references to the discussions of members who favoured the establishment of national specialists' unit for chemicals and waste management, which is expected to have positive implications in facilitating the implementation of Rotterdam Convention. The successful functioning of such units under the aegis of Montreal Protocol was cited while putting forth such claims.⁶⁸ These are some of the suggestions put forth by the members, which have the potential to positively impact the future courses of action.

Some of the recognized shortcomings of the framework are the limited target set to regulate the international trade of banned or severely restricted chemicals listed under Annex 3, and trade with non-parties being kept beyond the ambit of

⁶⁸ Working Group on Enhancing the Effectiveness of The Rotterdam Convention, United Nations, Report of the Working Group on Enhancing the Effectiveness of The Rotterdam Convention on the Work of its Meeting, UNEP/FAO/RC/EFF.1/4, (2018), https://www.informea.org/en/report-working-groupenhancing-effectiveness-rotterdam-convention-work-its-first-meeting.



⁶⁷ Synergies Success Stories Enhancing Cooperation and Coordination Among the Basel, Rotterdam and Stockholm Conventions, SUSTAINABLE DEVELOPMENT, https://sustainabledevelopment.un.org/content/documents/40synergies_success_stories_4web.pdf (last visited May 3, 2020).

the Convention, except for requiring the exporting parties exchange information specifying the regulatory status of the exported chemical within their territory. The Convention places an obligation on the parties to seek consent from the importing parties while exporting such chemicals as are subject to severe restrictions or bans within their territory, but not listed under the Annex 3 list. Only in case of the explicit consent by the importing party, the exporting party can ship the hazardous chemicals without contravening any provisions of the Convention.⁶⁹ This explicit consent clause exempts the ratifying parties from the obligation of preventing the trade of chemicals listed in Annex 3. Though the Convention was brought into effect to protect the importing parties, the onerous burden of ensuring implementation by formulating national legislations is on the parties themselves. The complexity of the matter makes it impossible for the countries to operate without the assistance of the Secretariat. The involvement of a non-party as an intermediary breaks the chain, and sets parties free from the compliance of PICC obligations. The Convention, by defining import and export as movements of chemicals from one party to another and excluding mere transit operations,⁷⁰ excludes the countries involved in transit operations from the PICC obligations.

The Convention imposes an obligation on the parties to structure their national institutions and infrastructure in such a way as to implement the obligations enshrined in the international instrument.⁷¹ Given that there is no binding obligation on the parties to establish shipment tracking, monitoring and enforcement programs, implementation suffers. If the PICC had a provision for the mandatory furnishing to the parties and the custom officers of the information essential to distinguish complying and non-complying shipments by mandating licensing and documentation of ships, it would have reached closer to achieving its vision.⁷² In the year 2018, India pointed out the priority actions that would successfully enhance the effectiveness of the Convention. By extending the technical assistance to developing countries and organising periodic training for DNAs, the effectiveness of the information exchanges can be enhanced. India considered developing non- punitive and facilitative

⁶⁹ Rotterdam Convention, art. 12.

⁷⁰ Id. art. 3(f).

⁷¹ Id. art. 15.

⁷² Richard W. Jr. Emory, *Probing the Protections in the Rotterdam Convention on Prior Informed Consent*, 12 COLO. J. INT'L ENVIL. L. & POL'Y 47 (2001).

mechanisms, and disseminating information regarding the alternative chemicals that could replace the hazardous chemicals as viable option.⁷³

Given that there are loopholes in the Convention and the possibility of lawful evasion exists, the positive impacts of Rotterdam Convention on the chemical industry have been limited in scope.

Article 10 of Rotterdam Convention⁷⁴ places an obligation on the parties to announce the decision with respect to the import of the chemicals listed in Annex 3. In response to the decision guidance document dispatched, the party shall decide either to consent to import, or not to consent to import, or to consent to import subject to the specified conditions. The following import decisions of India have been referred to in order to understand the effect of Rotterdam Convention on the import and export of chemicals.

Aldicarb is an extremely toxic systematic carbamate insecticide. It is observed that the handling of the product has the potential to expose the handlers to extreme toxicity. Its solubility and mobility in soil poses another risk of it reaching the aquatic organisms.⁷⁵ Prior to the banning of Aldicarb, female workers shouldering the responsibility of contracted chemicals, refilling and spraying tanks, were diagonised with the symptoms of mild to severe poisoning. Pesticide residues were discovered in drinking water and soft drinks. The unsafe occupational environment of farmers became the subject matter of concern. The training program initiated by Novartis in 1992 to educate the farmers from Coimbatore district to adopt safe handling techniques failed to bear results.⁷⁶ Further, the fact that Aldicarb is categorised as Extremely Hazardous made it crucial for the countries around the globe to reconsider its usage.⁷⁷ In pursuance of the provisions of the conventions, India decided not to consent to import the same.⁷⁸

⁷³ *Comment on Priority Actions to Enhance the Effectiveness of the Convention*, INFORMEA, https://www.informea.org/en/india (last visited May 16, 2020).

⁷⁴ Rotterdam Convention art. 10.

⁷⁵ *Aldicarb*, EXTENT TOXICOLOGY NETWORK, pmep.cce.cornell.edu/profiles/extoxnet/24d-captan/aldicarb-ext. html (last visited May 17, 2020).

⁷⁶ Francesca Manciniet.al, , *Acute Pesticide Poisoning among Female and Male Cotton Growers in India*, INFORMEA, https://www.informea.org/en/season-long-assessment-acute-pesticide-poisoning-among-farmers-three-villages-india (last visited May 17, 2020).

⁷⁷ *Guidelines to Classification of Pesticide by Hazard(Extremely Hazardous to Moderately Hazardous)*, WORLD HEALTH ORGANISATION, https://www.who.int/ipcs/publications/pesticides_hazard_rev_3.pdf (last visited Sept. 19, 2020).

⁷⁸ *Countries*, ROTTERDAM CONVENTION, http://www.pic.int/Countries/CountryProfiles/tabid/1087/language/en-US/Default.aspx (last visited May 17, 2020).

Aldrin, which was used to kill termites, grasshoppers, corn root worm and other insect pests, was banned by the Ministry of Agriculture order, considering its negative implications on human health. However, the export of 73.17 thousand kg to Hong Kong, Iran, Israel, Mauritius, Nepal etc. and the import of 79.32 kgs in 2016-2017, displays the lack of political will and the laxity in implementation. The field study in Dausa district, Rajasthan further confirmed the usage of aldrin on vegetables and its availability in the markets.⁷⁹ The detection of banned pesticides such as aldrin and diedrin in the atmospheric air of urban, suburban, agricultural, and coastal areas of Tamil Nadu confirmed the illegal usage of these pesticides.⁸⁰

Because of Polychlorinated Biphenyls' (PCBs') stability against thermal, chemical and biological degradation and its resistance to fire, it has been used as a dielectric and heat exchange fluid in industrial applications. It has been used as hydraulic fluid, plasticizer, heat transfer fluid in transformers and heat exchangers, carbonless carbon paper, inks, lubricants, waxes, cutting oils and adhesives, insulation fluid in capacitors and transformers. Its persistence and bioaccumulation, however, leads to the risk of human exposure.⁸¹ It can lead to various adverse health impacts, including immune deficiency, nervous system alteration, endocrine disruption, and gastrointestinal system bleeding and liver damage.⁸² In pursuance of the provisions of Convention, India decided to consent to import the same only in cases where license has been obtained on the recommendation of Department of Chemicals and Petrochemicals.⁸³ In the year 2016, the Central Government, in exercise of powers conferred under sub-section (1) of section 3 and clause (d) of sub-section (2) of section 6 of the Environment (Protection) Act, 1986 (29 of 1986), read with sub-rule (2) of rule 13 of the Environment (Protection) Rules, 1986, issued the draft Regulation of Polychlorinated Biphenyl Order, 2016. The order banned the manufacture and import of the chemical in India. From 31st December, 2025, its use in any form shall be

⁷⁹ *Persistent Organic Pollution in India*, Toxic Link, http://www.toxicslink.org/docs/POPs%20Country%20 Situation%20report.pdf (last visited May 18, 2020).

⁸⁰ S. Srimuraliand S Govindaraj, Distribution of Organochlorine Pesticides in Atmospheric Air of TamilNadu, Southern India, INT. J. ENVIRON. SCI. TECHNOL. 12(2015).

⁸¹ Polychlorinated Biphenyls(PCB's)- Environmental Implications, ENVIS Resource Partner on Control of Pollution Water, Air and Noise, http://cpcbenvis.nic.in/cpcb_newsletter/Polychlorinated%20 Biphenyls%20(PCB's).pdf (last visited May 17, 2020).

⁸² Khageshwar Singh Patel et al., *Polychlorinated Biphenyls Contamination of Sludge in India*, American Journal of Analytical Chemistry 6, 867-877 (2015).

⁸³ ROTTERDAM CONVENTION, http://www.pic.int/Countries/CountryProfiles/tabid/1087/language/en-US/ Default.aspx (last visited May 17, 2020).

prohibited. Notwithstanding the above prohibitions, any sale and trade for research activities was provided as permissible.⁸⁴ It is pertinent to note that after the issuance of the order, in 2016-17, 0.30 kgs of PCB was imported. In the subsequent year, there was no import.

The pesticide poisoning resulting in the deaths of 50 people, and hospitalisation of over 800 people, in India in late 2017 was an instance of the disastrous results of the unauthorised application of herbicides on the cotton fields. The investigations initiated in the light of such recurring deaths, found that Monocrotophos was banned in many countries.⁸⁵ Surprisingly, its use has continued in India, in spite of its listing in Annex 3.

As explained above, in the case of the export of the chemicals which are either banned or severely restricted, exporting states must engage in information exchange with the importing party. Trade can only be carried on with the explicit consent of the national authority concerned of the importing country. The exporting party shall be exempted from the obligation of preventing such transactions, provided that the chemical which is the subject matter of consideration is registered as a chemical in the importing nation or if there are instances of the import of such chemicals and the absence of regulatory actions being taken by the importing country concerned. The export notification should be sent to the importing party, providing an option to the importing authority to stop the transaction.⁸⁶ This might hinder the export of chemicals from India. As India is one of the most competitive exporters of chemicals in the world in terms of intermediates-market combinations,⁸⁷ adhering to these obligations might have its effect on the export of chemicals from India. These effects may be in terms of cancellation of an export order resulting in loss to the exporters, risk and liability involved in transport of such chemicals, etc.

It is also relevant to acknowledge the role of the World Trade Organisation in the control of the trade of such hazardous wastes and chemicals. In this vein, it is crucial to refer to the General Agreement on Tariffs and Trade (GATT). Article XX of the GATT

⁸⁷ Deb Kusum Das & Neha Gupta, Working Paper 371: *Climbing up India's Manufacturing Export Ladder: How Competitive are Intermediate Goods?*, Indian Council for Research on International Economic Relations, https://icrier.org/pdf/Working_Paper_371.pdf (last visited May 18, 2020).



⁸⁴ Notification on Regulation of Polychlorinated Biphenyl Order 2016, INDIAN ENVIRONMENTAL PORTAL, http://indiaenvironmentportal.org.in/content/427632/notification-on-regulation-of-polychlorinatedbiphenylspcbs-order-2016/ (last visited May 17, 2020).

⁸⁵ *The Illegal Trade in Chemicals*, UNITED NATIONS ENVIRONMENT PROGRAMME, https://www.unenvironment. org/resources/assessment/illegal-trade-chemicals (last visited May 18, 2020).

⁸⁶ Rotterdam Convention, art. 12.

provides for General Exceptions, which allows States, subject to conditions, to enforce measures that would otherwise be trade-restrictive. For the purposes of this discussion, the most relevant provisions are contained within Article XX(b) and Article XX(g). Article XX(b) allows States to impose measures necessary to protect human, animal or plant life or health. Article XX(g) allows for measures to be adopted relating to the conservation of exhaustible natural resources, if such measures are made effective in conjunction with restrictions on domestic production or consumption. Given the impact that the waste disposal industry has on their surrounding environment, owing to the introduction of toxic and hazardous chemicals into the water and atmosphere. it is GATT-compliant for States to enter into agreements or to introduce measures that prohibit the import of these wastes and chemicals into the country. However, it is necessary to appreciate the difference between Article XX(b) and Article XX(g). Article XX(g) includes the additional requirement that the measure be introduced in conjunction with restrictions on domestic production or consumption. Therefore, where States introduce these international measures, they ought to also place restrictions within the domestic economy.

This was noted in *Canada – Measures Affecting Exports of Unprocessed Herring and Salmon*, where a measure introduced by Canada was not found to be justifiable under Article XX(g), and in *United States – Restrictions on Imports of Tuna*, where a similar conclusion was reached in respect of the measure of the United States, specifically because it could not be shown that the United States had restricted the domestic consumption of tuna or tuna products in any manner.⁸⁸

The international mechanism has been criticized for being too lenient.⁸⁹ Greenpeace and other international organisations working for the protection of the environment have consistently argued that the existence of the Convention legitimized the transboundary trade of waste, rather than prohibiting it outright. Greenpeace, in particular, has raised objections to the fact that States were allowed to enter into agreements outside the Basel Convention, in essence allowing them an optout from the Convention provided they met environmental standards which have been prescribed in vague terminology. Another significant criticism aimed at the international regime is the fact that it does not call for public disclosures to be done in

⁸⁸ Panel Report, United States – Restrictions on Imports of Tuna, ¶ 4.5-4.6, 4.9-4.12. WTO Doc. 1L/5198 (Feb 22, 1982).

⁸⁹ David P Hackett, Legislation on Global Waste Control to Be Proposed by Year's End to Congress, 12 Int'L Env't Rep. (BNA) 425.

a simple manner. Industries and business need to disclose technical information, but such disclosures are of little value for the public, and do not further the conversation on the protection of the environment in a sustainable manner.

A final criticism is the fact that the existing mechanism does not hold businesses and industries accountable.⁹⁰ The approach adopted by the United Nations and States at large has been to develop a system that allows for industries to continue to generate waste as long as the trade is carried out in a sustainable manner, instead of eliminating the production of this waste at the source. This is why the Philippines and Canada can continue trade at large. It is also why there are currently no international disputes or invocations of State Responsibility for transboundary harm caused by waste trade. Additionally, as was pointed out earlier, there are knowledge gaps and enforcement challenges in the restriction of trade on chemicals. This is owing to the pace of chemical production development, and the lack of adequate regulation at present.

To remedy these, the Basel Ban Amendment was signed in 1995 and had become enforceable in 2019.⁹¹ The goal therein was to prevent the trade of hazardous wastes from OECD countries to non-OECD countries. However, this has sparked a debate, owing to the fact that it does not do anything to remedy the situation of South-South trade of industrial waste for example, between India and China, or India and Japan–which could now increase. Secondly, the Amendment may also be non-compliant with the General Agreement on Tariffs and Trade, by creating a restriction on an industry that precludes its existence.

CONCLUSION

The parties to Rotterdam Convention have ventured to strengthen its implementation. The decisions taken with respect to the Convention have acted as general rules or guidelines on ensuring their effectiveness at the national level, taking into consideration all the stakeholders. In a discussion pertaining to international trade in chemicals and the Rotterdam Convention, one cannot ignore the challenges faced by countries in implementing the Convention and putting in place the necessary national strategies and infrastructure for the same. A review of the lacunae as pointed out by stakeholders, and suggestions received from them, has to be conducted and given paramount importance for the implementation of the Convention. The strengthening

90 Comment, Exporting Hazardous Industries: Should American Standards Apply, 20 NYU J. INT'L P. 785.

⁹¹ Alan Andrews, Beyond the Ban – Can the Basel Convention Adequately Safeguard the Interests of the World's Poor in the International Trade of Hazardous Waste?, 5(2) LEAD Journal 167 (2009).

of customs control, developing national and regional positions prior to the Conference of Parties, developing policies, standards, strategies, harmonized classification codes, management of risk and emergency response standards are some of the points to be worked on extensively with reference to Rotterdam Convention by countries engaging in international trade in chemicals. It is imperative that developing countries requiring assistance in terms of technical knowledge and financial backing to implement the Convention get adequate resources. This would enable those countries to easily identify viable financial and management options to deal with chemicals and wastes so as to assist them in meeting the Convention obligations. The optimum utilization of resources, ensuring effective strategies of implementation, and the cooperation of all stakeholders ensuring safety should be of paramount importance to countries engaging in international trade in chemicals so as to protect the environment as well as the human health and wellbeing.

PART - C

Consolidated Report on the Findings of Research Conducted by Regional Partners



CHAPTER 9

Consolidated Report on the Findings of Research Conducted by Regional Partners*

INTRODUCTION

The Centre for Environmental Law, Education, Research and Advocacy, has collaborated with five law universities representing the five different regions of the country to study the management and disposal of hazardous chemicals across the country. The regional partners in this project are the West Bengal National University of Juridical Sciences, Kolkata, in the Eastern region, School of Law, Bennett University, Greater Noida in the North; Faculty of Law, Jagran Lakecity University, Bhopal in Central India; Symbiosis Law School, Symbiosis International (Deemed University), Pune in the West and School of Law, CUSAT University, Kochi in South of India. The regional partners have undertaken research primarily focusing on the chemical industries in their respective states, highlighting awareness about laws on chemicals and hazardous waste management, compliance with laws, challenges in implementations, recommendations etc. This chapter briefly outlines the research findings of four of our regional partners.

MAIN FINDINGS OF RESEARCH-STUDY ON CHEMICAL INDUSTRY IN THE STATE OF WEST BENGAL

Significance of Research Study

West Bengal is one of the largest states in Eastern India with major cities like Kolkata, Durgapur, Haldia, etc. serving as prominent industrial hubs. Kolkata, the capital of the state, is a metropolitan city with all modern facilities and is well-connected to other parts of India and the world. The state of West Bengal is divided into 23 districts. West Bengal is the sixth-largest economy in India and is home to one of the largest consumer markets.¹ Along with other industries, it also has a significant number of

^{*} We acknowledge the contribution of our regional partners – The Regional Partners for Southern India: Dr. Vani Kesari, Director School of Legal Studies, Cochin University of Science and Technology, Kochi;The Regional Partners for Central India: Prof. (Dr.) Yogendra Kumar Srivastava, Dean-Faculty of Law, Public Policy and Humanities Jagran Lakecity University; Ms. Ongmula Bhutia; Assistant Professor, JLU-SOL Coordinator – JLU Center for Environmental Law and Climate Change, SOL; Assisted by Dr. Deevanshu



chemical industries operating within the State, which manufacture a wide range of chemicals in this region. The state has a large consumption appetite for chemicals to catering to the enormous demands of the manufacturing sector and industries.² The gaps in demands and supply of chemicals, including hazardous chemicals in West Bengal, are bridged through imports from other states as well as from abroad. The total quantity of hazardous chemicals imported from foreign countries to the ports of West Bengal was 18,854 metric tonnes in the year 2019-20, which is 55% more than the imports for the year 2018-19.³

The state enjoys an advantage in terms of its location, which enables it to maintain proximity with large overseas markets like China, Bangladesh, Nepal, Bhutan and South East Asia as well as the domestic markets of the seven north-eastern states, Odisha, Jharkhand, Bihar and Uttar Pradesh. It has two large container and bulk handling ports, namely, Kolkata and Haldia. In addition, the established road connectivity, cheap labour, availability of abundant water, unlimited quantity of power and low cost of doing business in West Bengal make it a favourable destination for setting up industries.⁴

The chemical market in West Bengal includes both organised and unorganised market players. Both private, as well as public sectors, are part of the industry. Apart from a large number of privately owned industries that are operating in the state, wholly-owned subsidiaries and joint ventures like Mitsubishi PTA, Haldia Petrochemicals, Dhunseri Petrochemical, BASF, Sika Ag, Nalco Water India Ltd., PMC Rubber Chemicals and DIC India are also successfully running their operations in West Bengal.⁵ Although West Bengal does not come in the list of top ten hazardous waste generating states, it has 716 waste generating units in the state which generated

Shrivastava Head, Jagran School of Public Policy & International Affairs; Dr. Apoorva Dixit, Assistant Professor, JLU-SOL; Ms.SaumyaShaji, Assistant Professor, JLU-SOL; The Eastern Region: Dr. Sandeepa Bhat, Professor of Law, West Bengal National University of Juridical Sciences, Dulung Sengupta, West Bengal National University of Juridical Sciences; The Regional Partners for Western India: Dr.Shashikala Gurpur, Director, Symbiosis Law School, Pune and Dr. Smita Pandey, Assistant Professor, Symbiosis Law School, Pune, for supporting us with their comprehensive research in each of the region. 1 *West Bengal*, CONFEDERATION OF INDIAN INDUSTRY, https://www.cii.in/States.aspx?enc=5WcSaMoyzEfRFIFUNeIvYGPI9xL9HypQH+qrcmYEmb4xq/CgfDRa3RcPrTNzZYdVi+ObEzK6oFy+rReP/bWAyw== (last visited Dec. 30, 2020).

² *Chemical industry, Opportunities in West Bengal*, West Bengal Government, https://wb.gov.in/businesschemical-industry.aspx (last visited Dec. 30, 2020).

³ Source: Data collected from Kolkata Port Trust.

⁴ Chemical industry, Opportunities in West Bengal, https://wb.gov.in/business-chemical-industry.aspx (last visited Dec. 30, 2020).

1,52,235.85 metric tonnes of hazardous wastes in the year 2018-19.⁶ Most of these industries are clustered around the districts of Howrah, Kolkata, North 24 Parganas and South 24 Parganas.⁷

Unfortunately, there is just one Common Hazardous Waste Treatment Storage and Disposal Facility (TSDF) for disposal of hazardous wastes generated by all units in the state.⁸ It is located at Haldia, Purba Medinipur, which is almost 130 kilometres from Kolkata. The facility, named M/s. West Bengal Waste Management Limited, is a Public-Private Partnership between Haldia Development Authority and M/s. Ramky Enviro Engineers Ltd., and is in operation since 2006.⁹ It has an incinerator, a secured landfill, waste stabilization unit, temporary waste storage sheds, vehicle wash areas and a well-equipped laboratory.¹⁰ It is spread over an area of 70 acres and manages industrial wastes from industries located in West Bengal and Sikkim. The facility has a direct landfilling capacity of 1,20,000 TPA, landfilling after stabilization capacity of 60,000 TPA and incineration capacity of 10,800 TPA¹¹.

Industrial development is of utmost importance for any state and West Bengal is not an exception. Development of an important sector like chemicals is undeniably one of the prime concerns of the state authorities as it also forms the backbone of several other industries. However, the hazards attached with chemical industries and the wastes generated thereof cannot be ignored by the states as they have serious adverse effects on the environment, health and safety of people.¹²

The management of chemicals and chemical wastes in India involves shared responsibility between the Centre and States.¹³ While the Central Government is bestowed with the responsibility of enacting legislation and formulating policies

⁶ Annual Inventory on Hazardous and Other Waste Management of West Bengal, Year 2018-19, West BENGAL POLLUTION CONTROL BOARD, http://www.wbpcb.gov.in/writereaddata/files/HWM_AnnualInventory_18_19.pdf (last visited Dec. 30, 2020).

⁸ *Hazardous Waste Management*, West BENGAL POLLUTION CONTROL BOARD, http://www.wbpcb.gov.in/pages/display/36-hazardous-waste-management (last visited Dec. 30, 2020).

⁹ *Id*.

¹⁰ *Id*.

¹¹ *Id*.

¹² *Introduction to Safety in the use of Chemicals*, INTERNATIONAL LABOUR ORGANISATION, https://www.ilo.org/legacy/english/protection/safework/cis/products/safetytm/introduc.htm (last visited Dec. 30, 2020).

¹³ Final Report on Inventorization of 17 category/GPI/Red Category Industries prepared by Working Group for Inventorization of 17 category/GPI/Red Category Industries, CENTRAL POLLUTION CONTROL BOARD, http://164.100.107.13/upload/NewItems/NewItem_174_FinalReport_ onInventorizationof17CategoryGPIRedCategoryIndustries.PDF (last visited Dec. 30, 2020).

and regulations, the state governments have to ensure effective implementation and enforcement of the laws and regulations.¹⁴ Accordingly, the West Bengal Pollution Control Board (WBPCB) has the responsibility to implement the provisions of the Environment (Protection) Act, 1986; the Water (Prevention and Control of Pollution) Act, 1974; the Air (Prevention and Control of Pollution) Act, 1981 and Rules framed thereunder for sound management of chemical industries in the State¹⁵. Any person who intends to establish or operate any industry, operations or process, which is likely to discharge sewage or trade effluents, has to obtain consent from the WBPCB in the prescribed manner.¹⁶

Methodology

Despite a comprehensive legal and regulatory framework, and administrative efforts by the Central and state governments, the overall scenario of the status of management of chemicals and chemical wastes in West Bengal is not free from serious drawbacks and concerns. The industries are scattered all over the state, which makes their surveillance and governance a herculean task for the state. The lack of awareness and finances also add fuel to the non-compliance and non-adherence of laws and rules by the industrial units. The industries also face certain problems owing to the complexities and costs involved in the management, storage and disposal of chemicals and chemical wastes. In light of these factors, a field study was conducted to collect data from different authorities (Central Pollution Control Board, WBPCB, Customs Office, Kolkata Port Trust Office and the Common Hazardous Waste Treatment, Storage and Disposal Facility at Haldia) as well as from different chemical industries located in and around Kolkata, North 24 Parganas and South 24 Parganas, which house a major portion of chemical industries operating in West Bengal. This study outlines the findings of the field study by analysing the data collected to provide an insight into the practical nuances of management and handling of chemicals and chemical wastes in the state of West Bengal.

Key Findings and Recommendations

The chemical industry in West Bengal comprises of a generous number of small, medium and large units scattered over its 19 districts. However, due to the absence of

¹⁵ Compliance Inspection Procedure, WEST BENGAL POLLUTION CONTROL BOARD, http://www.wbpcb.gov.in/ writereaddata/files/%20inspectionpolicy_WBPCB_25.10.2017_final_2.pdf (last visited Dec. 30, 2020).

¹⁶ *Id*.

an inventory of all the chemical units operating in the state, the exact number of units remains unascertained. Many of these industrial units fall under the red category, and a large number of industries deal with hazardous substances and generate hazardous wastes.¹⁷ Although, as per the official data of the WBPCB, 716 hazardous waste generating units are operating in the state in 2019, it is feared that there might be more of such units which ought to be included in the inventory of hazardous waste generating units and monitored accordingly.¹⁸ These industrial units import, manufacture, store or trade in a variety of chemicals, which are hazardous and pose a serious threat to human health and the environment.

i. Increase in Industrial Production and Imports

The production of chemicals in West Bengal as well as imports have gradually increased over the years. Though the port authorities recorded much less imports, the WBPCB's statistics reveal a much higher level of imports in West Bengal.¹⁹ Even the WBPCB's statistics do not reveal the actual quantity of imports as about 20% of industries have not reported their imports to the WBPCB, which is found in the sample data collected from industries. In addition to this, some of the chemicals imported in West Bengal are very hazardous in nature and have even been prohibited in several countries.²⁰ They are capable of causing long-lasting damage to human health and environment. Almost half the quantity of imported chemicals is used for trading by the importers, and thereby, greater concerns arise due to the absence of a proper mechanism to monitor the internal distribution of these chemicals within or outside West Bengal after their imports. Thus, the imports through West Bengal pose higher risks not only within West Bengal but also in the neighbouring states.

ii. Lack of Technological Upgradation and Mordernisation

The chemical industry used to be one of the thriving industries in West Bengal but most of the chemical units in medium and small enterprises (MSE) sector in the state have fallen sick due to lack of modernization, technological upgradation, shortage

²⁰ Paraquat, mercury and lead are some of the examples of imports of very hazardous chemicals.



¹⁷ Performance Audit Report of Pollution by Industries in West Bengal, GOVERNMENT OF WEST BENGAL, https://cag.gov.in/sites/default/files/audit_report_files/Report_No_5_of_2018_Performance_Audit_ of_Pollution_by_Industries_in_West_Bengal_Government_of_West_Bengal.pdf (last visited Dec. 30, 2020).

¹⁸ Id.

¹⁹ As per the data collected from the WBPCB and industrial units, the quantity of hazardous chemicals imported in the year 2018-19 was approximately ten times more than the quantity of imports recorded by the Port authorities.

of working capital and stiff competition from large-scale industries as well as MSE products of other states.²¹ These industries also face many difficulties in adhering to the strict pollution standards²² and the same is reflected in the form of non-compliance of the industries to national as well as international norms relating to proper storage, handling and disposal of chemicals and chemical wastes. West Bengal has a huge consumption appetite for chemicals and this is evidenced by the sheer magnitude of chemicals used by industrial units in their daily course of operational and production activities.

iii. Health Hazards Posed by the Chemical Industry

The data collected from industries in West Bengal revealed that around half of the industries were using chemicals or generating wastes that can have serious health hazards and one-third of the industries were using chemicals or generating wastes that can harm both environment and human health. The chemicals being used, can potentially impact human health by causing chronic problems like germ cell mutagenicity, carcinogenicity, reproductive problems, damage the central nervous system, immune system, respiratory system and gastrointestinal system; severe skin burns, blindness, cardiac arrest or even death if swallowed directly. The chemicals also pose a significant threat as they can harm aquatic life, contaminate water, soil and air and bear high risks of causing environmental hazards. Use of hazardous chemicals in such a high quantum, quite contrary to our international commitments, increases the vulnerability of people to become helpless victims of chemical exposure.

iv. Lack of Proper Inventory or Information with the Pollution Control Boards

Despite a fully functional chemical industry in the State where such a wide variety of chemicals are imported, exported, manufactured as well as traded on a large scale, there is no inventory of such chemicals in West Bengal. The WBPCB does not have any comprehensive inventory or register containing the names of all chemical units operating in the State and the chemicals that are being handled by them. Therefore, there is nothing which can be used as a reference or yardstick for monitoring chemical management in the State by the WBPCB. The WBPCB largely depends upon

²¹ State Industrial Profile of West Bengal (2015-16), Micro, Small and Medium Enterprises, MINISTRY OF MICRO SMALL AND MEDIUM ENTERPRISES, http://dcmsme.gov.in/dips/state_wise_dips/state%20profile%20 of%20west%20bangal.pdf (last visited Dec. 30, 2020).

²² Id.

voluntary disclosures and procedural obligations such as the authorisation requests and import intimations for determining the number of units operating in the state and the chemicals being imported in a given year. This increases the risks of nondisclosures by the industrial units which may help them to evade from the process of compliance with laws and rules as well as the monitoring by the authorities.

The lack of inventory also acts as a hindrance in the path of prioritisation of certain chemicals and industrial units based on their hazardousness and threat to the public and environment. Thus, there might be instances of general monitoring of industries dealing with highly hazardous chemicals and wastes, which would otherwise require a higher level of monitoring than the rest of the industrial units handling less hazardous substances. The underestimation of the number of hazardous units during the inventorisation process in the State coupled with undervaluation of imports of hazardous chemicals by customs authorities and gaps in the implementation of national and international laws for proper storage, handling and disposal of chemicals and chemical wastes expose the state to the perils of unimaginable damage and loss of life.

v. Fragmented and Piece-Meal Approach among the Regulators

There are several other grey areas in the sound management and disposal of chemicals and chemical wastes in the state of West Bengal, which were evident in the field study. A common problem faced in India is that the responsibility for management throughout the life-cycle of chemicals is spread over a number of ministries such as agriculture, industry, shipping, labour, environment and health due to the crosssectoral nature of chemicals.²³ This leads to a fragmented approach and problem of coordination among the ministries, affecting the process of sound management of the chemicals. The existing anomalies and confused state of affairs pertaining to the management of chemicals can also be attributed to the fact that the provisions relating to the management of chemicals are scattered over 38 different laws and rules in the country²⁴, which makes the entire process of sound management of chemicals a complex affair.

²⁴ See generally G. Balaji, et al., Environmental Legislation for Chemical Management in India: An Agenda for Reform, 9(2) JOURNAL OF ENVIRONMENTAL RESEARCH AND DEVELOPMENT 494 497-502 (2014)



²³ Practices in the Sound Management of Chemicals, DIVISION FOR SUSTAINABLE DEVELOPMENT, UNDESA, https://sustainabledevelopment.un.org/content/documents/41Practices%20in%20the%20Sound%20 Management%20of%20Chemicals.pdf (last visited Dec. 30, 2020).

vi. Industrial Awareness

On the industrial awareness end, it was found that most of the industrial units are totally unaware of the international instruments relating to the subject area,²⁵ and even if some knew of their existence, they have very little idea about the provisions specified therein. While every industrial unit responded on the requirement of government certification, they had no idea about the most significant aspects of international instruments like PIC procedure, Decision Guidance Document and Movement Document. The Decision Guidance Document is the first stage of the PIC procedure and contains all necessary information on the basis of which the importing countries may or may not give the consent for import of hazardous chemicals. The Movement Document, on the other hand, acts as a tracking system and accompanies the shipments of chemicals and wastes that are hazardous in nature from the point of export to the point of entry of the shipment in the importing country. Therefore, for the management of chemicals and procedures can never be ignored.

Article 13 of the Rotterdam Convention requires exporting parties to provide each importer with a safety data sheet according to an internationally recognized format while exporting chemicals listed in Annex III, banned chemicals or severely restricted chemicals. Safety data sheets contain updated and essential information such as chemical and physical properties, health and environmental hazards, fire and reactivity data, first aid recommendations, storage, handling, packaging, labelling, disposal procedures and any other information relevant for safe handling of the chemicals.²⁶ Safety data sheets are one of the key tools in hazard communication and essential for sound management of chemicals²⁷. Therefore, it is absolutely essential to rely on the safety data sheet in handling such chemicals. Though 70% of the industries indicated their reliance on the safety data sheet, the rest of the industries rely on other sources while handling the chemicals. Some of the industries also revealed their dangerous practice of relying on internet sources in managing and handling chemicals and chemical wastes.

²⁵ The industrial data portrayed a very sad and shocking picture where only 22% of the industries have slight knowledge about the Minamata Convention on Mercury 2013 and 11% of the industries are aware of the Basel Convention 1989, the Rotterdam Convention 1998, the Stockholm Convention on Persistent Organic Pollutants 2001 and the Strategic Approach to International Chemical Management 2006.

²⁶ Sources of Information on Hazardous Chemicals, Rotterdam Convention, UN ENVIRONMENT PROGRAMME, http://www.pic.int/Implementation/RessourcesKit/SourcesofInformationonHazardousChemicals/ tabid/1503/language/en-US/Default.aspx (last visited Dec. 30, 2020).

²⁷ Id.

vii. Compliance on Storage and Transportation of Hazardous Substances and Waste:

As per the national laws and rules and international conventions, the containers used for storage of chemical and chemical waste should be leak-proof, non-corrosive, sealed, have the ability to withstand all weather conditions, and be suitable for handling of the chemicals and waste.²⁸ There are also established norms on labelling and storage of chemicals and chemical wastes. However, it is evident from the field study that there is a lack of uniformity in the packaging, labelling, and storage methods adopted by the industrial units in West Bengal. Lack of explicit guidelines, regular monitoring and industrial awareness are the primary reasons behind such disparity. Majority of industrial units are ignorant of Globally Harmonised System of labelling, which is crucial for distinguishing hazardous chemicals and wastes from other substances.

In terms of disposal of hazardous wastes, the common TSDF facility is not being utilised effectively by the industries. Some of the industries have proclaimed to have their own facility for disposal, which are not subject to proper scrutiny by the state authorities. A good portion of industries in West Bengal neither send their wastes to common TSDF nor have their own facility to dispose of their industrial wastes, which is highly dangerous. Though the industries contend lack of finances, distance from the common TSDF and other reasons for not using the common TSDF, such contentions cannot be allowed as defences for not complying with pivotal obligations like protecting human health and environment. It is also pertinent to note here that industrial units are focusing more on the safety requirements inside their establishments when the workers are handling chemicals and chemical wastes. However, in this process, they are missing out on the most significant aspect of dealing with the risks in transportation and disposal of chemicals and chemical wastes.

viii. Compliance Gap:

The compliance gap by the non-compliance industries is evident not only in their failure to submit import intimation and not complying with the norms on packaging, labelling, storage and disposal of chemicals and chemical wastes, but also in not submitting annual reports by hazardous waste generating units to the WBPCB. Unfortunately, the steps taken by the WBPCB in such instances have been highly inadequate, which further escalates the need for more robust implementation and



²⁸ Hazardous Waste (Management & Transboundary Movement) Rules, 2016, Rule 17.

enforcement mechanisms in the State. The problem of compliance gap is furthered by a lack of coordination between different authorities in the state. A classic example of this is the huge difference in the valuation of import of hazardous chemicals in the records maintained by the WBPCB and the port authorities. The WBPCB is under an obligation to communicate the import intimations received by it from the industrial units importing hazardous chemicals to the port authorities, and on the basis of which they are under the obligation to take necessary measures for handling the chemicals in an environment-friendly and sound manner under the MSIHC Rules. Such a gap in communication and coordination amongst the authorities responsible for the lifecycle management of chemicals is quite a major drawback of the existing system of governance of chemicals, which requires an overhaul.

ix. Suggestions to be incorporated

Development of an Inventory or Register of Chemicals and Chemical Industries

The first step in the direction of making amends to the current concerns in West Bengal should be the preparation and maintenance of an inventory or register of all chemicals used and chemical industrial units operating within the state. It should contain all relevant details and particulars that might be required for ensuring sound life-cycle management of chemicals right from their production or import until their sound disposal. Chemicals in such a register should be identified by internationally as well as locally used names and information on how they are being used, source of imports and subsequent storage or sale. Along with this information, safety data sheets and handling guidelines should be updated periodically. The models already existing and used by the developed countries may be referred to for developing a suitable one for West Bengal.

The register or inventory should also classify chemicals on the basis of their hazardous characters and the extent of the threat posed to human health and environment to facilitate prioritisation. Such prioritisation helps in giving more emphasis on the handling of high-risk chemicals than on the low-risk chemicals, and thereby, it aids the systematic and effective governance of chemicals and chemical wastes. This can be done only after analysing all the characteristics of chemicals and the potential hazards attached to their storage, handling and disposal. Similarly, industrial units should also be categorised as high and low priority units depending upon the chemicals handled

by them and all material information pertaining to those units should be maintained and updated in the electronic form to ensure effective monitoring and regulation. Given the involvement of different authorities to keep records of different phases of the life-cycle of chemicals, the online system of 'single registry' and 'reporting process' can be adopted. This would help in easy access to information and would do away with the problem of lack of coordination among different authorities, and thereby, increase in transparency.

• Adoption of Suitable Measures to Regulate Production and Imports

The inventories of hazardous waste generating units in West Bengal show an upward rise in the quantity of hazardous waste generated in the State. As emphasized in the international conventions, the parties should make efforts to reduce the generation of hazardous wastes at source. The State should make efforts to reduce the generation of hazardous wastes at source by using recycling or reusing processes, wherever possible. Using better technology for reducing the waste generation by increasing efficiency and finding better alternatives for raw materials or end products, which lead to the generation of hazardous wastes, should also be promoted by the State. These can be achieved only by the enhancement of research and development in this arena.

Import regulation is to be considered very seriously, especially in the wake of some highly hazardous chemicals entering into West Bengal. Curbing illegal trade in chemicals, as attempted by the SAICM, is the most crucial part of import regulation as most of the high-risk chemicals having potentia to cause serious damage to health and environment make entry through illegal trade. The port is the touch-point where the imported chemicals enter into the geographical domain of any country and is one of the essential stages in the cradle-to-grave management of chemicals. The port and customs officials should enforce stricter monitoring systems for inspecting and managing imported hazardous chemicals and should strictly curb illegal trafficking of chemicals. They should duly inspect all shipments containing hazardous substances and check all the compliances and necessary documents for detecting any instance of illegal trafficking or violation of standard legal procedures.

Taking Measures to Create Awareness

One of the most significant stakeholders in the proper implementation of international instruments relating to handling and management of chemicals and chemical

wastes are the industrialists. Unless they are aware of the nuances of international instruments and their significance in protecting life and environment, the practical implementation of international standards remains a far-fetched dream. Hence, the WBPCB, in collaboration with Ministry of Environment, Forest and Climate Change should conduct awareness drives amongst chemical industries operating in the State. The awareness programmes should comprehensively cover the need for reducing the import, production and use of hazardous chemicals and impress upon the industries to involve in any activity relating to hazardous chemicals only when it is absolutely essential. Different stage-by-stage standards for safety and other aspects in the handling and management of chemical and chemical wastes should be imparted to everyone dealing with hazardous chemicals.

While the development and implementation of a uniform standard for storage, packaging and labelling is essential, creating awareness amongst industries about the significance of uniformity is equally important. It should be made clear that uniformity and consistency in practices would avoid ambiguities, uncertainties and confusion, and would then avoid dangerous consequences. Even the industrialists' interests might be jeopardised in such circumstances as they may have to incur huge liability for damage caused. Implementation of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) should be enhanced in the State by creating awareness. Adoption of GHS facilitates the systematic identification of the hazards of chemicals and draws the attention of users for taking necessary measures for their safe handling and disposal.

The industrial attitude of 'not in my backyard' has to be corrected by informing them of the need for adopting safety measures even outside their industrial premises, especially during transportation and disposal of chemicals and chemical wastes. Need for better utilization of common TSDF has to be impressed upon the industries so that the hazardous wastes are disposed in a suitable manner. The commercial benefits should not override the environmental concerns, and thus, protecting the environment and public health is our collective responsibility. This has to be made clear to the industrialists.

• Ensuring Proper Disposal of Chemicals and Chemical Wastes

The common TSDF is established with huge investments for proper disposal of hazardous wastes as per the established standards. Unfortunately, a major portion of

chemical and hazardous waste generating units in West Bengal do not dispose of their wastes at the common TSDF. While some industries have ventured into establishing their own facility for disposal, others do not even have an appropriate mechanism for disposal. Even those industries which resort to common TSDF for disposal of hazardous wastes have a practice of storing the hazardous wastes for a long time to reduce operating costs of transportation.

Addressing the concerns of industries in terms of cost and distance of the common TSDF is required for promoting the use of common TSDF for proper disposal of hazardous wastes. Most industries contend the cost of disposal as an excuse against the use of common TSDF, and thereby, resort to cheap methods of disposal in their quest to maximize profits. Stringent steps need to be taken to curb such attitude of industries. However, in case of small industries, which face practical difficulties in having access to common TSDF due to their limited production, a mechanism needs to be developed for cost-effective collection and disposal of the wastes generated by them. Even the State Government can think in terms of establishing additional common TSDF near the industrial hubs to help in the reduction of cost of as well as the risk in transportation of hazardous wastes.

• Strengthening Enforcement Mechanism and Coordination between Various Authorities

Although India has quite an extensive legal framework for environmental protection, the lack of proper implementation and enforcement mechanisms has paralysed the system. The data collected from the WBPCB, industrial units and the common TSDF as well as reports published by government authorities suggested a huge gap in compliances by the industrial units in West Bengal. The practices adopted by industrial units are found to be violating the existing national and international laws. These violations cannot be left unpunished especially in light of their far-reaching consequences in terms of damage to health and the environment. Therefore, the regulatory and administrative framework for developing robust enforcement and implementation mechanisms is required for ensuring adherence to the existing laws and regulations. There should be provisions for stricter actions for violation of existing laws and non-compliance by industrial units in important areas such as submission of annual reports, import intimations and disposal of wastes.

Due to the lack of coordination between various authorities, there is also confusion regarding the appropriate authority for taking necessary action to curb violations. The

Hazardous Substances Management Division (HSMD) of the Ministry of Environment, Forests & Climate Change (MoEF&CC), Government of India, is the nodal point for management of chemical emergencies and hazardous substances. The HSMD division undertakes regulatory activities for framing necessary rules for sound management of chemical and chemical wastes, and provides necessary financial support to agencies responsible for their implementation. The State Pollution Control Board plays a pivotal role in the management of chemicals and chemical wastes in the state and protects the environment from their harmful impacts. Other relevant authorities responsible for the sound management of chemicals are the Department of Chemicals and Petrochemicals (which is the designated national authority (DNA) for industrial chemicals), the Department of Agriculture (which is the DNA for pesticides), the ports and customs authorities, Ministries of Health, Labour, Industry, Shipping and others who manage the chemicals at any stage of their lifecycle. The transportation of the chemicals is provided under the Motor Vehicles Act 1988, which also involves monitoring by the traffic police of the State. Proper coordination between all these authorities should be achieved through frequent dialogues, exchange of important information and joint meetings to avoid confusion in taking action against violators.

While above are some of the specific measures to be taken in the state of West Bengal, a holistic approach for addressing the problem in India would require consolidation of laws to have a single enactment for handling and managing chemicals and chemical wastes. There are different laws, rules and regulations governing various chemicals at different stages of their life-cycle, which make the existing framework complicated and scattered. Such a piecemeal approach adds on to the confusion, and thereby, prevents the effective implementation of international standards. There is a need to create a law similar to REACH in India, which has replaced around 40 different environmental laws in the European Union, for sound management of chemicals and protection of human health and environment.²⁹ Such a single law approach would simplify the existing system and make compliance easier for the industrial units. The long-term solution to the problem is in banning or phasing out the use of hazardous chemicals by the industries. All authorities concerned with the management and handling of chemicals and chemical wastes must come together to identify the chemicals that are severely hazardous and capable of causing long-term and unimaginable damage to human health and environment. In consultation with the concerned industries, such

²⁹ G. Balaji, et al, 'Environmental Legislation for Chemical Management in India: An Agenda for Reform', 9 J. ENV'L RES. DEV.494, 504 (2014).

chemicals should either be banned or at least phased out progressively by developing safer alternatives through research and development. Such initiatives can also start at the state level as Kerala has already taken the initiative to ban paraquat, which is banned in as many as 32 countries.³⁰

MAIN FINDINGS OF RESEARCH-STUDY ON CHEMICAL INDUSTRY IN THE STATE OF KERALA

The primary objective of this study was to investigate the role of chemical industries concerning the management and disposal of chemical and hazardous wastes in the state of Kerala. The main focus was on industrial practices, knowledge and opinions of the chemical industry units in Kerala regarding their hazardous waste management as well as a centralized study upon the use and management of Endosulfan in the state. The other objectives of the study pertaining to the state are summarized as follows:

- Identifying the major legal frameworks in relation to the hazardous wastes' management and its challenges.
- Identifying the role of Kerala State Pollution Control Board and challenges faced by them regarding the chemical and hazardous waste management.
- Identifying the legal drawbacks of the management of hazardous wastes and the chemical "Endosulfan" in the state of Kerala.

Significance of Research Study

Kerala is a rapidly growing state in India in terms of industrial development. The State is dominated by oil and petrochemical refining, fertilizer, chemical, metallurgical, distillery, textile and other industries. All these sectors have a high potential for generating hazardous waste and causing damage to the environment. A variety of products ranging from organic and inorganic chemicals, drugs and pharmaceuticals, soaps and detergents, plastic and petrochemicals are manufactured. According to the latest inventories of Hazardous Waste Generation in Kerala, prepared by the Kerala Pollution Control Board and released in 2017-18, there are 1215 hazardous waste generating industries, of which most units are situated in the commercial capital of Kerala.

³⁰ Banjot Kaur, *There is no antidote to paraquat herbicide, ban it: Odisha docs to gout*, DownToEARTH (Sept. 17, 2019), https://www.downtoearth.org.in/news/agriculture/there-s-no-antidote-to-paraquat-herbicide-ban-it-odisha-docs-to-govt-66779.



The above-mentioned factors highlight the relevance of the research in the State. Thus, it is quite necessary to research upon the stages of import, storage, transportation, packaging, labelling, handling, managing and disposal of chemical and hazardous waste, and also enquire about the monitoring and implementation of legal instruments in relation to it. A notable study has to be focused upon the usage of Endosulfan as it has brought about inexplicable human sufferings, loss of life, while virtually wiping out biodiversity and seriously damaging the ecology of the area. The mushrooming of a number of chemical industries in the State has made it necessary to study the situation of hazardous waste management in the state of Kerala with special reference to Endosulfan.

Methodology

The methodology adopted was mainly empirical with field study conducted by the research team. The research team identified 27 chemical industries including the Common Hazardous Waste Treatment facilities, Storage and Disposal Facility at Kerala Enviro Infrastructure Ltd., Ernakulam, Kerala State Pollution Control Board, Thiruvananthapuram and the Panchayat and estate at Kasargod, most affected by Endoslfan. Questionnaires were the primary tool for collection of data. The graphical statistical data tools used for the interpretation of data for the sake of study were Piecharts, Histograms, Bar graphs, Flowcharts, etc.

Key Findings and Recommendations

The main findings with regard to the compliance of hazardous waste management laws in the state of Kerala are briefly summarized as follows:

- *i.* Techniques for hazardous wastes management in Kerala are of different types based on the convenience of the industries - The industries mostly use CTSDF which is situated in Ernakulam district. It is the only CTSDF available in Kerala. Certain industries use incinerators and landfill methods of their own. Recycling and reusing are important waste management techniques in Kerala. The industries individually use secured landfill methods and incinerators. Some industries have also introduced Effluent Treatment Plants, filter systems, scrubbing systems etc. for the minimization of the rate of occurrence of pollution in the State.
- ii. Implementation of National & International Regulations governing Chemical & hazardous waste management undertaken in Kerala - Indian

and international laws constitute the guiding legal frame work for regulating and managing the hazardous waste generated by the industries in Kerala. Besides which those Acts and Rules, the Kerala Panchayat Raj Act and the Municipality Act specify duties of local self-governments to regulate the domestic and solid waste management in Kerala. There is less significance given to the international conventions and hazardous management rules concerning the transboundary movement of hazardous wastes as there is no major import and export of hazardous wastes in the State.

- *iii. Monitoring of legal frameworks on hazardous waste management in Kerala mandates immediate attention-* Monitoring and administrating the industries is a huge task as they are scattered all across the State. The data analysis revealed that industries have complained about the lack of assistance from the government. Some of the industries are unaware of the legislations and were reluctant to respond to such questions. The KSPCB answered that the regulation with regard to waste management is only done during the initial stage of incorporation of the industry. Later, the industry submits reports to the concerned district PCB offices. There is lack of inspection conducted by the concerned authorities. Additionally, the annual KSPCB inventory reports are not properly updated and their vague replies result in non-coordination in the regulation of the hazardous waste management in Kerala. These contradictory views and vague replies reveal that compliance with the legal frameworks is not monitored properly in Kerala. This is further corroborated by the lack of responses and non-applicable answers from the industries and the KSPCB.
- *iv. Challenges of industries in Kerala in relation to waste management: Need for meaningful interventions* It is found that there is lack of modernization, adequate technologies, financial aid, timely implementation of new waste disposal methods, and dearth of land for disposal of wastes, etc., which are a great hindrances for the industries to function properly in an environmentally-sound manner. There is gap in communication between the KSPCB and industrial authorities. Moreover, an important finding is that there is no import and export of hazardous wastes in Kerala. An exception is with regard to the export of wastes in a minor quantity for recycling to other states. Such information is retrieved from the KSPCB and the industries have responded that they have their own mechanisms for recycling which entails passing on

the waste to recycling units in the State. Thus, there are several contradictory pieces of information found from the units and the KSPCB. This again reflects improper monitoring and implementation of hazardous waste management in Kerala.

- v. Role of KSPCB and the Challenges it faces: An Assessment The primary role of the Board is to prepare annual reports and annual inventory of hazardous waste management in Kerala. The Board is only a directing authority to give proper guidelines on handling of hazardous waste in an environmentally safe manner. The Board monitors the industries and checks whether the industries comply with these Rules. In case of any shortcoming on the part of industries, the Board gives instructions or modifications on it. The Board has to assess the report on the basis of the details provided by the respective industries. The challenge herein lies in the fact that the pollution levels at the time of recording of samples may vary from time to time. It has to prevent environmental degradation by the activities of industries which makes it necessary to assess the waste management and disposal by the Board.
- vi. Effects of Endosulfan tragedy in Kerala: An incurable malady Endosulfan is enlisted as a hazardous chemical in various international conventions, especially the Rotterdam Convention. The judiciary has played a vital role in banning Endosulfan in Kerala and in providing compensations to the victims who have suffered as a result of its usage. Even though Endosulfan is banned in Kerala, it is used in various parts of the state under other names. The victims of the Endosulfan tragedy are in a miserable condition. There are victims who have not yet received compensation from the government and the concerned industries yet.However, it is found that the KSPCB also played a decisive role in banning Endosulfan in Kerala and also in imposing punishment for its usage.
- *vii. Certain impediments in the management of hazardous wastes in Kerala: Flaws in the existing regulatory patterns*– The legal regime is spread across a plethora of legislations including the Kerala Panchayat Raj Act, 1994 and Kerala Municipality Act,1994 addressing solid and domestic waste management. Despite the presence of several regulatory laws the need for a consolidated law on hazardous waste management is imperative, as there is a need for uniformity in action and implementation.

viii. Miscellaneous - The apathy of chemical industries towards the waste management rules is also another factor which was inferred in this study. Industrialists and their management were reluctant to divulge information regarding the waste management and its legal compliances. Most of them did not give clear responses to the questions, while trying to avoid the interview and by trying to change the intention behind the data collection. Such attitude of the management shows that the waste generated by these industries is not properly disposed of and that they are not complying with the legal instruments in a proper manner. Moreover, it can be inferred that the monitoring and implementation of the regulations are inadequate and hence necessitates a total re-examination and re-assessment.

MAIN FINDINGS OF RESEARCH-STUDY ON CHEMICAL INDUSTRY IN THE STATE OF MADHYA PRADESH

Significance of Research Study

Madhya Pradesh is the second largest state in India. It is situated in the heart of the country covering 9.5% of India's area. In Madhya Pradesh the industries are largely natural resources driven. It has plenty of natural wealth in the form of Limestone, Coal, Soya, Cotton, Bauxite, Iron, Diamond ore, Silica etc. The State has a strong industrial area in the sectors such as Auto, Textile, Cement, Steel and Soya Processing Units. Major Central Public Sectors Undertakings like BHEL Bhopal; National Fertilizer Ltd., Vijaypur Dist. Guna; Security Paper Mill Hoshangabad; Currency Printing Press, Bank Note Press, Dewas; Alkaloid Factory, Neemuch; Ordnance Factory, Itarsi; Gun Carriage Factory, Jabalpur and Nepa Mills, Nepa Nagar are also located in the State.³¹

In Madhya Pradesh, the generation of hazardous waste is not just limited to large scale industries, but numerous small and medium scale industries also contribute to its generation. The state of Madhya Pradesh is ranked among the top 11 hazardous waste generating states, which is a matter of legitimate concern. The 11 states together contribute about 92.57%³² of the total hazardous waste generated, out of which 2.66% of hazardous waste is generated by the state of Madhya Pradesh.

³¹ Inventory of Hazardous Waste Generated in Madhya Pradesh, General description of Madhya Pradesh, MADHYA PRADESH GOVERNMENT, http://www.mppcb.nic.in/TP/ABSTRACTInvent14.pdf (last visited July 29, 2020).

³² National Inventory on Hazardous Waste Generation and its Management (2017-2018), CENTRAL POLLUTION CONTROL BOARD, https://cpcb.nic.in/uploads/hwmd/Annual_Inventory2017-18.pdf (last visited July 29, 2020).

Methodology

The researchers have analysed the quantity of the hazardous waste generated in Madhya Pradesh. Data available in the website of the Madhya Pradesh Pollution Control Board has been relied upon. The highest quantity of hazardous waste generated was in the year 2014-15 (286963.9975 metric tonnes) and the least was in the year 2015-16 (89940.7244 metric tonnes).33 According to the information collected from the officials of MPPCB, it was found that the State restricts dumping/ disposing of hazardous wastes generated by other states. Moreover, Madhya Pradesh does not dump its own waste in any other state. Although it was permitted earlier, but due to the high procedural technicalities, the same has now been restricted. MPPCB allows the import of hazardous wastes only for the purpose of utilization and not for dumping. As per the official report submitted by the MPPCB to CPCB in the year 2018-19, the import and export of the hazardous wastes stands at zero. However, there are thirteen units which have been authorized to import hazardous wastes in the State of Madhya Pradesh. Over the span of five years, the numbers of industries which generate wastes have certainly increased but the quantity of the waste generated has remarkably declined.

Madhya Pradesh, despite being the second-largest state of India and also being among the top 11 states in India in terms of generating hazardous wastes, continues to have just one Common Hazardous Waste Treatment Storage and Disposal Facility for the disposal of hazardous wastes generated by all industrial units in the State. M.P. Pollution Control Board has developed a laboratory for characterization of hazardous wastes at its Research Center in Bhopal. This laboratory has been recognized under Environment (Protection) Act, 1986 and is carrying out the analysis of Hazardous Waste samples.

The Madhya Pradesh Pollution Control Board has also established a separate hazardous waste management cell called the "Hazardous Substance Management Division" at head office level. The head office is working through its regional offices which are spread across the State and are keeping regular vigil on the industries. The authorization/renewal to the large and medium scale industries are issued by the head office while the authorization to small-scale industries is issued by the regional offices. As per the information collected from the MPPCB officials, the Pollution

³³ Inventory of Hazardous Waste, (2014-2019), MADHYA PRADESH POLLUTION CONTROL BOARD, http://www.mppcb.mp.gov.in/Hazardous%20Waste.htm (last visited July 19, 2020).

Control Board has established a grievance cell for industries and the general public at the head office level and the regional level. The Pollution Control Board hears grievances every Tuesday.

Key Findings and Recommendations

i. Number of Units Operating in Madhya Pradesh:

A total of 26 units in the state of Madhya Pradesh have been permitted by the State Pollution Board for the utilization of hazardous waste as per the Rule 9 of the Hazardous and Other Waste (Management and Transboundary Movement) Rules, 2016 on the basis of standard operating procedures (SOPs) or guidelines developed by the CPCB.³⁴

Post the prominent decline of about 68% in the amount of waste generated, the quantity of hazardous waste generated by these units was on the rise since the year 2016. In the year 2016-2017, the quantity of waste generated showed an increase up to 125880.7683³⁵ metric tonnes which was approximately 40% more than the former year. In the year 2017-2018, the value rose further to 251234.72³⁶ metric tonnes which was again an elevation of about 99% in the waste generation. The year 2018-2019 showed a slight decline with 222652.55³⁷ metric tonnes breaking the continuity of continuous aggravation of values.

ii. Disposal of Hazardous Waste:

During monsoon no disposal of hazardous waste is permitted in the state of Madhya Pradesh. The landfill facility in this season is completely covered and protected so that the rainwater cannot enter into the landfill sites. The storage of hazardous wastes facility has an appropriate containment system as per the "Spill Prevention, Control and Counter Measures Plan", which has been duly approved by the MPPCB. The entire container holding the hazardous wastes has to be marked "Hazardous Waste", in red colour both in English, Hindi and in the vernacular language.³⁸ The occupier or the

³⁸ Common Treatment Storage & Disposal Facility (CTSDF) In the State of Madhya Pradesh, Handling and Storage of Hazardous Wastes, MADHYA PRADESH STATE POLLUTION CONTROL BOARD, http://www.mppcb. nic.in/ctsdfhn.htm (last visited July 29, 2020).



³⁴ Integrated Plan For effective implementation of provisions of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 (2018-2019), MADHYA PRADESH POLLUTION CONTROL BOARD, http://www.mppcb.mp.gov.in/proc/Integrated-Plan.pdf (last visited July 29, 2020).

³⁵ Id.

³⁶ Id.

³⁷ Id.

operator is under the obligation to take necessary precautions to prevent accidental ignition or reaction of ignitable or reactive wastes.

iii. Use of Technology in Disposal

Madhya Pradesh Pollution Control Board has developed a software for online tracking of hazardous waste movement end-to-end from generator to actual user/CTSDF. The system provides facilities of instant generation of manifest with QR code along with the details of stock deduction. The software provides facility to the CTSDF and actual users to move the generators who are sending their waste for disposal/processing. The software facilitates the generator to know the actual users of their wastes and also the pool of transporters available with compliance of CPCB guidelines for transportation of hazardous wastes³⁹.

iv. Identification of Disposal Facilities

In compliance with the CPCB guidelines for the compliance with Rule-18 of Hazardous and Other Wastes (Management and Transboundary movement) Rule, 2016 for safe disposal of hazardous and other wastes, a total of 14 transporters have been authorized by the MPPCB with about 112 vehicles which are fully equipped with GPS system, Color Coding, 10th passed driver, etc.⁴⁰

In compliance with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, the Madhya Pradesh State Pollution Control Board (MPPCB) and Madhya Pradesh State Industrial Development Corporation (MPSIDC) have identified a site measuring about 50 acres for the Common Treatment, Storage and Disposal Facility (CTSDF) at Pithampur Industrial Area, District Dhar (M.P).

The Common Treatment Storage and Disposal Facility (CTSDF) is operative since 2006. The site is designed to dispose hazardous waste for 20 years at the rate of 50,000 MT/Y through direct landfill (DL), 20,000 MT/Y through Landfill after Incineration (LAT) and 20,000 MT/Y through incineration.⁴¹ The CTSDF site has facility for disposal of all types of hazardous wastes in the form of temporary waste storage area, solidification/stabilization area, incinerator, secured land fill and laboratory for analytical purposes.

³⁹ Integrated Plan For effective implementation of provisions of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 (2018-2019), Software Tracking System of Hazardous Waste In Madhya Pradesh, Madhya Pradesh Pollution Control Board, http://www.mppcb. mp.gov.in/proc/Integrated-Plan.pdf (last visited July 29, 2020).

⁴⁰ Id.

⁴¹ *Id*.

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v. Use of 3Rs and Other Mechanisms

In accordance with the Rule-4 of the Hazardous Waste (Management and Transboundary) Rules 2016, the Madhya Pradesh Pollution Board is promoting the management of hazardous and other wastes by means of prevention, minimization, reuse, recycling, recovery, utilization including co-processing and safe disposal. The MPPCB is promoting the reuse and reclamation of useful materials in a manner that is safe and protective for the human heath as well as the environment.

In the year 2018-2019, there were 52 industries engaged in recycling Lead Acid Battery Scrap which had recycled 123710 metric tonnes. 15 industries were recycling used oil or waste oil recycled 133100 metric tonnes and 42 industries were recycling non-ferrous metals and utilizing hazardous wastes under Rule 9 as per SOPs issued by CPCB and they have recycled 1569070 metric tonnes.⁴² In consultation with the CPCB, the MPPCB had identified 4 hazardous waste dump sites in Ratlam and Maksi and they have been closed between the year 1997 to 2003. The proximate quantity of the waste stored at various locations (industrial premises and nearby area) is 23,594 MT and waste shifting proposals (Rs. 6.60 crore) to TSDF, Pithampur, Dhar had been forwarded to CPCB and MoEF&CC on April 17, 2008.⁴³

The Central Government has enacted Hazardous Wastes (Management and Transboundary Movement) Rules, 2016 and the Manufacture, Storage and Import of Hazardous Chemical Rule, 1989. The industries associated with the use, storage, treatment, processing or disposal of hazardous wastes are directly covered under the ambit of the above-mentioned Rules. Section 25 of the Environment (Protection) Act, 1986 gives the Central Government the authority to regulate hazardous wastes in India. Further, whoever fails to comply or meet the requirements of the provisions of the said Act or the Rules shall be punishable with a term of imprisonment extending to five years or fine which may extend to 1 lakh rupees or with both and in case of continuance of the contravention, an additional fine extending to five thousand rupees per day shall be imposed.⁴⁴ If any industrial unit is engaged in the generation, processing, treatment, package, storage, transportation, use, collection, destruction, conversion, offering for sale, transfer of the like of the hazardous wastes, it has to obtain authorization from the Madhya Pradesh Pollution Control Board.⁴⁵

⁴² *Id*.

⁴³ Id.

⁴⁴ The Environment (Protection) Act, 1986, § 15

⁴⁵ *Hazardous Waste Management in Madhya Pradesh*, Madhya Pradesh Pollution Control Board, http://www.mppcb.nic.in/pdf/Hazardous_Mangt_in_MP.pdf (last visited July 29, 2020).

vi. Reporting Requirements in Madhya Pradesh

Form No.	Details	To Be Submitted/Issued/ Maintained by
Form 1	Application for authorization/renewal of authorization for collection/reception/ treatment/transport/storage/disposal of hazardous waste.	Occupier/Operator of Facility
Form 2	Authorization for occupiers, re-processors, re-users and operators of a facility for collection, reception, treatment, storage, transport, and disposal of hazardous wastes.	State Pollution Control board
Form 3	Format for maintaining records of hazardous wastes by the occupier/operator of facility.	Occupier/Operator of Facility
Form 4	Annual returns pertaining to the generation of Hazardous Wastes.	Occupier/Operator of Facility
Form 5	Application for grant/renewal of registration of industrial units processing environmentally-sound management facilities for reprocessing /recycling.	Industrial Units
From 7	Application for Import or Export of hazardous wastes for reprocessing/recycling/reuse.	Importer & Exporter Industry
Form 15	Application for filing Appeal against the order passed by CPCB/SPCB/PCC	Any person aggrieved by an order of supervision or cancellation or refund of authorization or its renewal.

TABLE – 1: Details of the Various Forms to be submitted⁴⁶

vii. Suggestions to be incorporated

- In the Hazardous Waste (Management and Handling) Rules, a time limit must be specified for validity of authorization granted by State Pollution Control Boards and Committees with respect to the collection, reception, treatment, transportation, storage and disposal of hazardous wastes.
- The Hazardous Waste (Management and Handling) Rules must prescribe the standard conditions, which can be considered by the State Pollution Control Boards or Committees while granting authorization for disposal of hazardous wastes. This change in the Rules will ensure the prescription of uniform conditions, which will eliminate arbitrariness.

- Time limits must be specified in the Rules for the construction of the landfills with regard to disposal of hazardous wastes.
- The Rules should strictly impose a duty upon the Government to provide incentives to those industries, which are engaged in recovery, reuse and utilization of the hazardous wastes generated.
- The Rules must be amended to make the Pollution Control Board officials personally liable if they fail to discharge their duties stipulated by the Rules.
- Apart from landfill and incineration methods for disposal of waste, newer technology/methods may be stipulated by the Rules to convert hazardous waste to non-hazardous waste form. Such technologies may include thermal treatment, chemical treatment, physical treatment, biological treatment.
- The occupier or the generator of the waste should be compulsorily made to adopt a clean production scheme, in order to minimize the production of hazardous waste generation.
- The MPPCB should appoint a neutral body which should comprise of the members of civil society, academicians, legal practitioners, environmentalists, and the representative from the industries. It should work as a watchdog for the proper implementation of the provisions of international as well as domestic laws. The reason why the researchers suggest a neutral body is to strengthen the enforcement mechanism.
- The State PCB should delegate certain powers and responsibilities to the municipal corporations to ensure checks and balances at the grassroots level.
- It was observed while conducting this research that there is only one common treatment storage and disposal facility in the entire state of Madhya Pradesh. Hence, it is suggested that more of such units or facilities should be established in order to smoothen the process of disposing hazardous waste.
- In the prevailing circumstances of this pandemic the State PCB should devise certain methods and mechanisms to dispose the hazardous wastes which are being generated in the hospitals.
- One of the basic steps to bring change in the society involves bringing awareness to the stakeholders. Under this research, the stakeholders are not
only the pollution control boards but the industries generating hazardous wastes as well. It is to be noted that the burden of implementation cannot be overemphasized on the Pollution Control Board and there is an imperative need to increase the accountability of the industries as well. This can be done by creating awareness among the industries about their roles and responsibilities towards the environment.

• It is to be noted that change being the only constant, one needs to be updated with the changing times. The state PCB should send its suggested amendments to CPCB. These amendments should be made only after due consultation with other stakeholders like industries, academicians, environmentalists and social activists.

While the usage of uniform norms in hazardous waste management and capacity building are significant, making businesses mindful of the critical necessity of consistency is similarly significant. Indeed, the industrialists would be disadvantaged in such conditions as they may be made liable for the harm caused. Usage of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) ought to be upgraded in the state by creating awareness. Selection of GHS encourages the identification of proof of dangers of synthetic substances and encourages stakeholders towards taking essential measures. The mentality of 'not in my backyard' must be remedied. Requirement for better use of regular TSDF must be put forth for industrial ventures. Business advantages ought not to supersede the ecological concerns.

MAIN FINDINGS OF RESEARCH-STUDY ON CHEMICAL INDUSTRY IN THE STATE OF MAHRASHTRA

Significance of Research Study

Maharashtra is one of the key players in the industrial sector in terms of investment. Maharashtra is located in the Western coast of India with the Arabian sea on one side and the Shayadri mountain range on the other side. Maharashtra has been at the forefront of driving India's industrial development and continues to attract the highest quantum of investments, both domestic and foreign. Maharashtra accounted for about 25.82% share in the overall FDI inflows in India in 2018-19.⁴⁷ The state capital, Mumbai is also India's financial capital and boasts some of the best financial infrastructures in

⁴⁷ Directorate of Industrial Safety and Health, MAHARASHTRA DISH NEWS, https://mahadish.in/ (last visited Dec. 30, 2020).

the country. The State has established industries in every sector including engineering, automobiles and auto-components, chemicals, drugs and pharmaceuticals, textiles, information technology, biotechnology and many others. The State contributed 22% to India's exports. This included gems and jewels, petrochemicals, readymade garments, cotton yarn, metal and metal products, agro-based products, engineering items, drugs and pharmaceuticals, plastic and plastic items.

With chemical and chemical products comprising 9% of the total industries in Maharashtra, it stands at 16% of total chemical industries in India and 17% of total production of chemicals in the country. The State has 13 chemical zones at Ambernat, Badlapur, Butibori, Dombivali, Kalyan-Bhivandi, Kurkhumb, Lote-Parshuram, Mahad, Patalganga, Roha, Taloja, Tarapur and TTC. The key players in the industry are Biostadt, BASF (the chemical company), Asian Paints, Dow, Ashapura Minichem Ltd, Dorf Ketal, Imerys, Monsanto, Tata, Laxmi Organic Industries Ltd, and Ion Exchange India Ltd. These key players constitute the majority of industries disposing chemical and hazardous waste. Other industries are also responsible for discharging such waste but they only constitute a minor share. Most of these key players are situated in Pune region.

Methodology

The methodology adopted was a combination of doctrinal as well as empirical method of data collection. The empirical method was employed to receive responses from various stakeholders, especially the chemical industries operating in and around Pune region, through structured questionnaire and interview tools. An extensive review of literature has been made to supplement and corroborate the information and evidences collected during field visits. The data collected from all sources was carefully examined to identify the gaps in implementation of the national laws and international instruments relating to chemical waste management in Maharashtra. Analytical, critical and comparative tools were used to arrive at conclusions. The empirical study was done with the primary aim of exploring the position of Maharashtra in handling and disposal of chemical and hazardous industrial waste. The doctrinal study was done to compile the international instruments for handling, disposal and management of chemical and hazardous waste and to evaluate the national legislations, rules, regulations and policies for handling, disposal and management of chemical and hazardous waste from industries. The main objective of the project was to understand the awareness regarding chemical and hazardous waste management and disposal.



KEY FINDINGS AND RECOMMENDATIONS

i. Pressing Issues associated with handling and management of hazardous waste in Maharashtra

- The industries are supposed to follow certain rules and regulations. The trader, generator, user, exporter and importer are supposed to label, contain, transport and audit the hazardous waste to minimize environmental pollution. The Board is supposed to conduct audit and keep records of hazardous waste from generation to ultimate disposal. However, despite the existence of these legislations and guidelines, limitation in their enforcement is a major challenge.
- The Board reels from the problem of shortage of financial resources, lack of adequate number of staff, non-existent standardized protocols, and the absence of authority.
- The Chemical and Hazardous Waste Management Rules specify that their noncompliance will attract financial penalty and, in some cases, imprisonment. The owner cannot transgress the Rules regarding transportation, storage and recycling of hazardous waste. The Rules also specifically direct the state governments to identify locations for the construction of hazardous waste treatment facilities. However, there have not been enough sites in the state for the rules to come into effect.
- In Maharashtra, there are 5 biomethanisation, 5 pelletisation and 2 Waste to Energy units for hazardous and chemical waste treatment.
- Maharashtra has only 4 Common Hazardous Waste Treatment, Storage and Disposal Facilities (CHWTSDF) installed and operating successfully. Out of these, two are in the Mumbai region (Mumbai Waste Management and Taloja and Trans Thane Waste Management Association). Maharashtra Enviro Power Ltd. is in the Pune region in Ranjangaon and the last one is Vidharbha Enviro Protection Ltd. at Butibori Industrial Area in the Nagpur Region. The total amount of hazardous waste generated in 2018-19 was 1065810.15 MT/A.⁴⁸

⁴⁸ *Annual Report*, MAHARASHTRA POLLUTION CONTROL BOARD, https://www.mpcb.gov.in/sites/default/files/ about-us/annual-report/MPCB_AR_Eng16032020.pdf (last visited Dec. 30, 2020).

Pune was chosen for the conduct of empirical study since it is the city with the maximum number of red list factories. Additionally, the presence of the research team in Pune facilitated the conduct of empirical research in the city. After a thorough doctrinal and non-doctrinal study, the researchers have come to the following conclusion, recommendations and scope for further study.

Maharashtra as a state not only tops the list of most industrialised states but also tops the list of the states with highest amounts of disposal of hazardous waste and red industries, and as such there is a need to implement the following:

- Audit of Companies by MPCB: The annual reports presented by the MPCB do not specifically show the percentage of public limited industries as opposed to private limited companies. The Reports have mentioned that out of 92,081 industries only 7,542⁴⁹ are considered to be white industries. Out of 13,936 red industries, there are 506 industries which can be categorised as 'highly polluting industries'.⁵⁰ While collecting the empirical data, the researchers became aware that companies refrained from disclosing any information to the private investigators or researchers. It is recommended that MPCB while conducting an audit of companies should categorise them on the basis of what rules and regulations are easily followed and the ones that are ignored or omitted easily. Moreover, the audit should also be done of the industries which are defaulting every year. Lastly, the audit also needs to be done half-yearly and the results should be open for public viewing.
- **CETP Industries Proportion**: Gujarat has a high number of CETP and a number of them are about to be established. Although Maharashtra has the highest number of industries, the number of CETPs is disproportional.
- **Time of taking action:** Units which are disposing off effluents without following the rules should first be issued a show cause notice, following which directions should be proposed, giving interim directions and finally closure should be ordered if the directions are further flouted.
- **Public Awareness:** Public has a right to be protected and respected. In the matters of mis-management of chemical and hazardous waste, the health and safety of public is directly affected. Therefore, RTI petitions must be filed by

⁴⁹ Id.

⁵⁰ Id.

the public. Public participation needs to be ensured in NGT hearings related to chemical and hazardous waste, through social activist groups. The EIA model of public participation and consent needs to be followed for setting up and working of chemical and hazardous waste factories near residential areas.

- **Proper Documentation:** There needs to be a proper mechanism to document the type and form of waste disposal and the medium of disposal as per Basel Convention and Indian rules and regulations.
- **Gaps in Rules and Regulations:** The gaps in monitoring, supervision and implementation of rules and regulations of hazardous and chemical waste management should be filled.
- **Consent to establish new chemical factory:** There is a need to strike a balance between giving consent to a new factory and its effect on environment. Public participation, EIA, social activist groups and the involvement of other ministries like Ministry of Health and Family is also necessary.
- **Stringent Laws against repeat offenders:** There need to be stringent measures adopted against defaulters. The principles of No Fault Liability, Polluter Pays Principle, Precautionary Principle and Public Liability should be imposed with strict measures.
- **Corruption Check:** Corruption may be one of the factors which aids defaulters to slip out of the clutches of authority. Some very high-level authorities have been accused of taking bribes in lieu of giving consent for operating chemical factories.⁵¹ Although, the MPCB presents an annual report, an internal audit report of the employees and board members also needs to be put in public domain for benefit of all.
- Awareness amongst Factory Owners: There is a need for awareness building amongst the owners of factories. Although, during the empirical study, the respondents unequivocally said that they were aware of the laws pertaining to hazardous waste but the manner of disposal of their waste did not corroborate the same. Also, through the study of secondary data the problem of lack of awareness was clearly established as one of the primary reasons for improper handling and management of hazardous waste.

⁵¹ Shrutika Shruti, Anti-Corruption Branch Nabs Two Pollution control Officers for Graft, TIMES OF INDIA (Mar. 9, 2017), https://timesofindia.indiatimes.com/city/thane/anti-corruption-branch-nabs-twopollution-control-officers-for-graft/articleshow/57542065.cms.

- **Media Awareness:** There is a tendency among media houses to actively report only those cases which have had disastrous impact on health and environment. Therefore, the media needs to be sensitized on the reporting of circumstances which if not checked might lead to disasters. This kind of media coverage will alert the public and lead to positive outcome.
- **Public–Private Partnership:** Following the Gujarat model, Maharashtra should also implement the public-private partnership for establishment of CETPs, and other facilities ensuring proper disposal of chemical and hazardous waste.
- **Incentivization Scheme:** Following the model devised by the Gujarat Pollution Control Board, MPCB should design a scheme to incentivize industries that follow proper rules and regulations to ensure the disposal of chemical and hazardous waste. MPCB can provide incentives in the form of tax reduction, NOC exemption, etc.
- **Handbook on training and pollution control:** The major recommendation made is preparation of a handbook which can be extensively used for training the employees and members of Central and State Pollution Control Board. The hand book can play the role of spreading awareness about laws, rules, regulations, governing bodies, authorities involved along with their duties and powers.



PART - D

Overview of the Major Chemical Sectors in the Country

CHAPTER 10

LAWS REGULATING ORGANIC CHEMICALS

INTRODUCTION

Chemicals have become an essential part of our lives, and are used in almost all spheres of activity right from cleaning our homes to saving our lives. The Indian Chemicals Industry has an immense production range, including inorganic chemicals, synthetic organic chemicals like drugs and pharmaceuticals, dyes and intermediates, pigments, fine and specialty chemicals, chlor-alkali, pesticides, colorants and alcoholbased chemicals, etc. India ranks sixth in the world in the production of chemicals and fourth in the production of agro-chemicals.¹ India also produces and consumes organic chemicals. The components of synthetic organic chemicals can be better understood with the help of the following chart.²

An exhaustive list of organic chemicals can be found in Chapter 29 of the Harmonized System Nomenclature.

Domestic Legal Framework

In India, the parent legislation for the use and storage of chemicals is the Environmental (Protection) Act, 1986. However, this Act does not define "chemicals", and only provides for what constitutes hazardous chemicals. Under this legislation, the Ministry of Environment, Forest and Climate Change has enacted three sets of rules to govern the hazardous chemical industry in India.

Manufacture, Storage and Import of Hazardous Chemical Rules, 1989

The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 have been amended twice, first in 1994 and then in 2000. As the name suggests, the Rules govern the manufacture, storage and import of the hazardous chemicals in India. Rule 18

¹ Department of Chemicals & Petro-Chemicals, Ministry o Chemicals and Fertilizers, Government of India, http://chemicals.nic.in/chemical (last visited May 18, 2020).

² Technical EIA Guidance Manual for Synthetic Organic Chemicals Industry, http://environment clearance.nic.in/writereaddata/Form-1A/HomeLinks/TGM_Synthetic%20Organic%20 Chemicals_010910_NK.pdf (last visited May 18, 2020).

provides that the transport of hazardous chemicals shall be governed by the provisions of the Motor Vehicles Act, 1988. The Rules define hazardous chemicals to mean,

- "(i) Any chemical, which satisfies any of the criteria, laid down in Part I of Schedule I and is listed in column 2 of Part II of this Schedule;
- (ii) Any chemical listed in column 2 of Schedule 2;
- (iii)Any chemical listed in column 2 of Schedule 3³

The regulatory requirements vary for the chemicals listed under the different schedules of the Rules. Schedule 1 of the Rules consists of two parts. Under the first part, chemicals meeting the following criteria are designated as hazardous chemicals: -

- Toxic chemicals: oral LD50 <200mg/kg, or dermal LD50 <2,000mg/kg or inhalation LC50 < 10mg/L;
- Flammable gases: i.e., gases that are ignitable when in a mixture of 13 percent or less by volume with air;
- Flammable liquids: liquids with flash points under 90 degrees Celsius;
- Explosives.⁴

The second part of the schedule lists 684 chemicals which are deemed to be hazardous. This list includes various organic chemicals such as benzene, ethyl alcohol and formaldehyde. The Rules impose the following obligations on the manufacturers of any of the chemicals falling under Schedule 1 of the Rules:

- To identify the hazards associated with their industrial activity, and take adequate steps for the prevention and control of any accident.⁵
- To provide information and training to on-site workers to ensure their safety.⁶
- To notify the authorities concerned within 48 hours of the occurrence of any major accident.⁷

To provide safety data sheets and label every container of hazardous chemicals.8

- 6 *Id*.
- 7 *Id.* Rule 5.
- 8 *Id.* Rule 17.

³ Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, Rule 2(e).

⁴ *Id.* Schedule V.

⁵ *Id.* Rule 4.

In addition to these obligations, any person who is importing hazardous chemicals into India has to provide the Chief Controller of Imports & Exports with the following information before 30 days of import, or as soon as reasonably possible, but not later than the date of import:

(i) the name and address of the person receiving the consignment in India;

- (ii) the port of entry in India;
- (iii) the mode of transport from the exporting country to India;
- (iv) the quantity of chemical(s) being imported; and
- (v) complete product safety information.9

Schedule 2 of the Rules contains a list of chemicals which require storage in isolation in case they meet the prescribed threshold limit. This list includes organic chemicals such as ethylene oxide. Schedule 3 provides a list of chemicals to which rules 7 to 15 shall be applicable, and if a site is handling chemicals in a quantity over the prescribed thresholds, it will be regarded as a major accident hazard installation and be subject to reporting, safety audits, and contingency plan requirements.¹⁰ This list includes organic chemicals such as benzidine and chloromethyl.

Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

Hazardous waste is defined under section 3(17) to mean, "any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances", and includes –

- waste specified under column (3) of Schedule I;
- waste having equal to or more than the concentration limits specified for the constituents in class A and class B of Schedule II or any of the characteristics as specified in class C of Schedule II; and
- wastes specified in Part A of Schedule III in respect of import or export of such wastes or the wastes not specified in Part A but exhibit hazardous characteristics specified in Part C of Schedule III;"¹¹

⁹ *Id.* Rule 18.

¹⁰ Id. Schedule III.

¹¹ Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Rule 3(17).

The Rules specify the hierarchy of waste management activities: prevention, minimization, reuse, recycling, recovery, co-processing, and safe disposal.¹² They have simplified the procedure for getting permission from the State Pollution Control Boards for managing the hazardous wastes, and specifying the necessary infrastructure required for a manufacturer to apply under these rules to remove any ambiguity. Now the manufacturer simply needs to make an application to the State Pollution Control Board by filing the Form 1. This Form has to be accompanied by the State Pollution Control Board's consent to establish and operate the facility under the Water (Prevention and Control of Pollution) Act, 1974 and the Air (Prevention and Control of Pollution) Act, 1981.¹³

The Manufacturer has to maintain a record of the waste managed by him under Form 3, and submit annual returns containing details specified under Form 4 to the State Pollution and Control Board before the 30th June of the next financial year. The Rules provide that the manufacturers cannot store the hazardous and other waste for a period exceeding 90 days, and they are required to maintain records of the sale, storage etc. of these wastes.¹⁴

The Rules prohibit the import of hazardous and other wastes from any country for any purpose other than recycling, recovery, reuse, and utilisation including co-processing, and mandate the approval of the Ministry of Environment, Forest and Climate Change for imports for these purposes. The approval has to be sought by filing Form 5, which has to be accompanied with the prior informed consent of the exporting country for waste categorized under Schedule III Part A.¹⁵ The import of wastes listed in Part D of Schedule III does not require the consent of the Ministry of Environment, Forest and Climate Change. The importer has to furnish the information under Form 6 to the customs authorities.¹⁶

The export of hazardous waste is allowed only with the prior permission of the Ministry of Environment, Forest and Climate Change. This approval is sought through Form 5, along with the furnishing of requisite insurance cover.¹⁷ After the Ministry gives its approval within 60 days of the receipt of an application for export, it may impose

- 14 Id. Rule 8.
- 15 *Id.* Rule 12.
- 16 *Id.* Rule 13.
- 17 Id. Rule 14.

¹² *Id.* Rule 4.

¹³ *Id.* Rule 6.

any condition that it deems fit, and the exporter has to ensure that the shipment is accompanied with Form 6 and records of the exported waste are maintained under Form $3.^{18}$

The import of metal scrap, paper waste, and various categories of electrical and electronic equipments for re-use has been exempted from the need for obtaining the Ministry's permission.¹⁹ The State Governments can establish joint treatment facilities on their own or in collaboration with any of the manufacturers. The latter can also establish these facilities on their own, but the design and setup have to meet the standards prescribed by the State Pollution Control Boards.²⁰

Any operator of a common facility (developed jointly by more than one manufacturer, with or without the State Government) or occupier of a captive facility (developed within the factory of the Manufacturer) has to maintain records of the waste handled by them under Form 3, and file annual returns under Form 4 with the State Pollution Control Board, on or before 30th June of the following financial year.²¹ The manufacturers handling the hazardous wastes are required to package such wastes as per the guidelines issued by the State Pollution Control Boards.²²

The transportation of the hazardous waste has to be in accordance with the rules made under the Motor Vehicles Act, 1988, and the guidelines issued by the Central Pollution Control Board.²³

The manufacturer is required to provide the transporter with the information required under Form 9 (regarding the nature of the waste, and measures to be taken in cases of emergency) and the containers need to be labelled as per Form 8.²⁴ In case of the interstate transfer of the hazardous waste, the prior consent of the State Pollution Control Boards of the transit states needs to be taken, and the responsibility in case of an accident will lie with either the sender or the receiver of the waste, whosoever has taken the requisite permission of the State Pollution Control Boards. The manifest should indicate which party bears the responsibility.²⁵

- 20 *Id.* Rule 16.
- 21 Id.

- 24 Id.
- 25 Id.

¹⁸ *Id*.

¹⁹ Id. Schedule III Part B.

²² *Id.* Rule 17.

²³ *Id.* Rule 18.

The person sending the hazardous waste is required to prepare 7 copies of the manifest as per Form 10, each copy bearing a different colour code and to be sent to different persons as specified under Rule $19.^{26}$

The State Pollution Control Boards are required to prepare annual inventories (amount of waste generated, recycled recovered, etc.) based on the annual returns received under Form 4, and the same shall be submitted to the Central Pollution Control Board by the 30th of September, each year. The Board will then prepare the consolidated review report on the management of hazardous and other wastes also including its own recommendations, and forward the same to the Ministry of Environment, Forest and Climate Change before 30th December, every year.²⁷ The manufacturer, importer, and exporter have been made liable for any damage which may be caused to the environment, or to any third party, due to the improper handling and management of the hazardous waste.²⁸

The list of Waste Constituents with Concentration Limits has been revised as per international standards and drinking water standards.

The following items have been prohibited for import:

- Waste edible fats and oil of animals, or vegetable origin;
- Household waste;
- Critical Care Medical equipment;
- Tyres for direct re-use purpose;
- Solid Plastic wastes including Pet bottles;
- Waste electrical and electronic assemblies scrap;
- Other chemical wastes, especially in solvent form.²⁹

Schedule II lists the chemical wastes which are considered hazardous if they are present in excess of the quantities specified under the Rules. The Schedule includes organic chemicals such as Arsenic, Benzine, Chloroform, 1,2- Dichloroethylene, Naphthalene, etc.

²⁶ *Id.* Rule 19.

²⁷ Id. Rule 20.

²⁸ *Id.* Rule 23.

²⁹ *Id.* Schedule VI.

Ozone Depleting Substance (Regulation and Control) Rules, 2000

These rules strictly control the production, import and use of ozone depleting substances (ODCs) in India. Most of these ODCs are banned in India.

The list of chemicals which are banned under Schedule 1 includes many organic chemicals, such as:

- Trichlorofluoromethane,
- Dichlorodifluoromethane,
- Trichloro trifluoroethane,
- Dichlorotetrafluoroethane,
- Chloropentafluoroethene,
- Bromochlorodifluoromethane,
- Bromotrifluoromethane,
- Dibromotetrafluoroethane,
- Chlorotrifluoromethane,
- Pentachlorofluoroethane,
- Tetrachlordifluoroethane,
- Heptachlorofluoropropane,
- Hexachlorodifluoropropane,
- Pentachlorotrifluropropane,
- Tetrachlorotetrafluoropropane,
- Trichloropentafluoropropane,
- Dichlorophexafluoropropane,
- Chloroheptafluoropropane, etc.

Schedule IV of the Rules provides for different groups of ozone depleting substances. There are different cut-off dates prescribed for the phasing out use of each such group. Schedule V of the Rules allows the producers/traders/importers, etc., to register with the relevant authorities, and such registration allows the former to continue dealing with the ozone depleting substances for the period prescribed under Column 4 of the

same schedule. This is essentially a method to phase out the use of ozone depleting substances.³⁰ Furthermore, Schedules II and III of the Rules prescribe the maximum quantity of ozone depleting substances which can be manufactured.³¹

Schedule VI of the Rules lists certain countries, and trade in ozone depleting substances is not allowed for countries which are not listed under the Schedule. The importer/exporter needs to avail a license from the Director General of Foreign Trade in order to undertake such business.³²

Any person seeking to purchase any ozone depleting substance has to provide a declaration under Part 1 of Schedule XII, mentioning their name, address, the reason for purchase, etc.³³ The Rules further prescribe restrictions on new investment, and regulate the import, export and sale of ozone depleting substances. They also prescribe the monitoring and reporting requirements for the persons dealing with such substances.

Domestic Authorities

The authorities, for the purpose of the enforcement of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, have been specified under Schedule VII of the Rules. The Schedule also lays down the responsibilities of the authorities.³⁴ The authorities and their responsibilities are as follows:

The Ministry of Environment, Forests and Climate Change, under the Environment (Protection) Act, 1986, is responsible for:

- The Identification of hazardous and other wastes;
- Granting permission to exporters of hazardous and other wastes;
- Granting permission to importer of hazardous and other wastes;
- Granting permission for the transit of hazardous and other wastes through India;
- Promoting the environmentally sound management of hazardous and other waste;

³⁰ Ozone Depleting Substances (Regulation and Control) Rules, 2000, Rule 3.

³¹ *Id.* Schedule IV.

³² Id. Rule 4.

³³ *Id.* Schedule XII.

³⁴ Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, Schedule VII.

- Sponsoring training and awareness programmes on Hazardous and Other Waste Management related activities.

Central Pollution Control Board constituted under the Water (Prevention and Control of Pollution) Act, 1974, is required to:

- Co-ordinate the activities of State Pollution Control Boards;
- Conduct training courses for authorities dealing with the management of hazardous and other wastes;
- Recommend standards and specifications for the treatment and disposal of wastes and leachates;
- Recommend procedures for the characterisation of hazardous wastes.
- Inspect facilities handling hazardous waste as and when necessary;
- Maintain sector-specific documentation to identify waste for inclusion under these Rules;
- Prepare and update guidelines to prevent or minimise the generation and handling of hazardous and other wastes;
- Prepare and update guidelines/ Standard Operating Procedures (SoPs) for recycling, utilization, pre-processing, and co-processing of hazardous and other wastes;
- To prepare an annual review report on the management of hazardous waste;
- Any other function assigned by the Ministry of Environment, Forest and Climate Change, from time to time.

State Government/Union Territory Government/Administration is responsible for:

- The identification of site(s) for common Hazardous and Other Waste Treatment Storage and Disposal Facilities (TSDF);
- The assessment Environment Impact Assessment (EIA) reports and convey the decision of the approval of site or otherwise;
- Acquiring the site or informing operators of facilities or occupiers or associations of occupiers to acquire the site;
- The notification of sites;

- The periodic publication of an inventory of all potential or existing disposal sites in the State or Union Territory.

State Pollution Control Boards or Pollution Control Committees constituted under the Water (Prevention and Control of Pollution) Act, 1974 are responsible for:

- The inventorisation of hazardous and other wastes;
- The grant and renewal of authorisation;
- The monitoring of compliance with various provisions and conditions of permission, including conditions of permission for exports and imports issued by the Ministry of Environment, Forest and Climate Change;
- Examining the applications for imports submitted by the importers, and forwarding the same to Ministry of Environment, Forest and Climate Change;
- The implementation of programmes to prevent or reduce or minimise the generation of hazardous and other wastes;
- Taking action against violations of these Rules;
- Any other function under these Rules as assigned by Ministry of Environment, Forest and Climate Change from time to time.

Directorate General of Foreign Trade

- The grant of license for import of hazardous Trade constituted under the Foreign Trade (Development and Regulation) Act, 1992 and other wastes;
- The refusal of licenses for trade in hazardous and other wastes that are prohibited for import and export;
- Port authority under Indian Ports Act, 1908 (15 of 1908) and Customs Authority under the Customs Act, 1962 (52 of 1962);
- Verifying the documents;
- Informing the Ministry of Environment, Forests and Climate Change of any illegal traffic;
- Examining the wastes permitted for imports and exports, wherever required;
- Training officials regarding the provisions of these Rules, and in the examination of hazardous and other wastes;



- Taking action against exporters or importers for violations under the Indian Ports Act, 1908 or Customs Act, 1962;

The authorities for the purpose of the enforcement of the *Manufacture, Storage and Import of Hazardous Chemical Rules, 1989* have been specified under Schedule V of the Rules. The schedule also prescribes the responsibilities of the authorities.³⁵ These responsibilities are:

The Ministry of Environment, Forests and Climate Change, under the Environment (Protection) Act, 1986, is responsible for the notification of hazardous chemicals as per Rules 2(e)(i), 2(e) ii) & 2(e)(iii);

The Chief Controller Imports & Exports, under the Import & Exports (Control) Act, 1947, is responsible for ensuring the legality of the imports of hazardous chemicals as per Rule 18;

The Central Pollution Control Board or State Pollution Control Boards or Committees under Environment (Protection) Act, 1986, as the case may be, are responsible to enforce directions and procedures in respect of the isolated storage of hazardous chemicals, including the enforcement of the following-

- The notification of major accidents as per Rules 5(1) and 5(2);
- The notification of sites as per Rules 7 to 9;
- The creation of Safety Reports in respect of isolated storages as per Rule 10 to 12;
- The preparation of on-site emergency plans as per Rule 13;
- The import of hazardous Chemicals and the directions and procedures regulating the same, as per Rule 18.

The Chief Inspector of Factories appointed under the Factories Act, 1948. The duties relate to the enforcement of directions and procedures applicable to the industrial installations and isolated storages covered under the Factories Act, 1948, and dealing with hazardous chemicals and pipelines including inter-state pipelines. The inspector must enforce the following rules: -

- The notification of major accidents as per Rule 5(1) and 5(2);
- The notification of sites as per Rules 7 to 9;



³⁵ Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989, Schedule V.

- The formulation of safety reports as per Rules 10 to 12;
- The preparation of on-site emergency plans as per Rule 13;
- The preparation of off-site emergency plans in consultation with the District Collector or District Emergency Authority, as per S. No. 9 of the 5th Schedule.

The Chief Inspector of Dock Safety, appointed under the Dock Workers (Safety, Health and Welfare) Act, 1986. Their duties pertain to the enforcement of directions and procedures in respect of industrial installations and isolated storages dealing with hazardous chemicals and pipelines, that are present inside a port covered under the Dock Workers (Safety, Health and Welfare) Act, 1986. They must enforce the following rules: -

- The notification of major accidents as per Rules 5(1) and 5(2);
- The notification of sites as per Rules 7 to 9;
- The creation of Safety Reports as per Rules 10 to 12;
- The preparation of an on-site emergency plan as per Rule 13;
- The preparation of an off-site emergency plans in consultation with the District Collector or District Emergency Authority as per S. No.9 of the 5^{th} Schedule.

The Chief Inspector of Mines appointed under the Mines Act, 1952. Their duties pertain to the enforcement of directions and procedures in respect of industrial installations and isolated storages dealing with hazardous chemicals, with respect to the following rules:

- The notification of major accidents as per Rules 5(1) and 5(2);
- The notification of sites as per Rules 7 to 9;

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- The creation of Safety Reports as per Rules 10 to 12;
- The preparation of an on-site emergency plan as per Rule 13;
- The preparation of an off-site emergency plans in consultation with the District Collector or District Emergency Authority as per S. No.9 of the 5th Schedule.

The Atomic Energy Regulatory Board appointed under the Atomic Energy Act, 1972. Its duties pertain to the enforcement of the following directions and procedures:

- The notification of major accidents as per Rule 5(1) and 5(2);
- The approval and notification of sites as per Rule 7;
- The preparation of safety report and safety audit reports as per Rule 10 to 12;
- The acceptance of on-site emergency plans as per rule 13;
- Assisting the District Collector in the preparation of off-site emergency plans as per serial number 9 of the 5th Schedule.

The Chief Controller of Explosives is appointed under the Indian Explosive Act and Rules, 1983. The chief controller's duties include the enforcement of directions and procedures as per the provisions of the Explosives Act, 1884 and the Rules made there under. Furthermore, in respect of industrial installation and isolated storages dealing with hazardous chemicals and pipelines including inter-state pipelines, their duties are:

- The notification of major accidents as per Rules 5(1) and 5(2);
- The approval and notification of sites as per Rule 7;
- The creation of safety reports and safety audit reports as per Rules 10 to 12;
- The acceptance of on-site emergency plans as per Rule 13;
- Assisting the District Collector in the preparation of off-site emergency plans as per S. No.9 of the 5th Schedule.

The District Collector or District Emergency Authority designated by the State Government is tasked with the preparation of off-site emergency plans under Rule 14.

The Centre for Environment and Explosive Safety (CEES), Defense Research and Development Organisation (DRDO), Department of Defense Research & Development, Ministry of Defense is tasked with the enforcement of directions and procedures in respect of laboratories, industrial establishments, and isolated storages dealing with hazardous chemicals under the Ministry of Defense.

The authorities for the enforcement of Ozone Depleting Substance (Regulation and Control) Rules, 2000 have been specified under Schedule V³⁶ of the Rules:



³⁶ Ozone Depleting Substances (Regulation and Control) Rules, 2000, Schedule V.

- An officer not below the rank of a Deputy Secretary in the Ministry of Environment & Forests is tasked with the registration of producers of Ozone Depleting Substances;
- The Director General of Foreign Trade is tasked with providing the licenses for the import/ export of products made with or containing Ozone Depleting Substances;
- An Officer of the particular producer not below the rank of Manager, if the ozone Depleting Substances have been produced in India, is tasked with the registration of the traders/ dealers/ wholesalers/ sellers of Ozone Depleting Substances;
- The officer-in-charge of the Small Industries Services Institute in the respective jurisdiction under the Small Industries Development Organisation, under the Ministry of Small Scale, Agro and Rural Industries, is tasked with:
 - The registration of persons/ enterprises engaged in activities specified in column (2) of Schedule IV;
 - The registration of person having facilities to reclaim Ozone Depleting Substances;
 - The registration of persons having facilities to destroy Ozone Depleting Substances;
 - The registration of manufactures, importers & exporters of compressors.

INTERNATIONAL FRAMEWORK

STOCKHOLM CONVENTION

One of the foremost international instruments which deals with organic chemicals is the Stockholm Convention on Persistent Organic Pollutants.³⁷ It was entered into with the purpose of protecting human health and the environment. Together with the Rotterdam and Basel Conventions, it governs the management of hazardous chemicals, including Persistent Organic Pollutants (POPs). The aim of the Convention is to "eliminate persistent organic chemicals worldwide by either prohibiting their production and use or gradually reducing them."³⁸

³⁸ Heidelore Fiedleretal et al, *A Tool for the Global Regulation of Persistent Organic Pollutants*, Chemistry International 4 (Apr.-June, 2019), https://www.degruyter.com/view/journals/ci/41/2/article-p4. xml#:~:text=The%20Stockholm%20Convention%20on%20POPs,of%20hazardous%20chemicals%20 and%20wastes.



³⁷ Stockholm Convention on Persistent Organic Pollutants, May 22, 2001, 2256 U.N.T.S. 119.

Even the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes³⁹ was entered into for the purpose of protecting human health and the environment from the *"negative effects of the inappropriate management of hazardous wastes worldwide*". The Convention also mandates the proper and safe disposal of the chemical waste, to protect humans and the environment.

Similarly, the *Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade*⁴⁰ was entered into to protect human health and environment, and to foster the sense of common and shared responsibilities among members of the international community with respect to the import of hazardous chemicals. The Convention promotes the exchange of information among parties regarding the import of the chemicals covered, and how the parties must take precautionary measures like labeling, direction for use, etc.

The Council of the United Nations Environment Programme requested for the formation of the Intergovernmental Forum on Chemical Safety (IFCS) to ascertain the impact of POPs on human health and environment. The Governing Council of the UNEP agreed with the recommendations of the IFCS and decided to form an internationally binding framework. Finally, the Convention was adopted in 2001, and entered into force in 2004.

Article 1 of the Convention defines its objective. It states: *"Mindful of the precautionary approach, to protect human health and the environment from the harmful impacts of persistent organic pollutants."* The Convention also defines POPs as those chemicals that remain the same and intact for a greater amount of time, have high mobility, can spread over a wide geographical area in less amount of time as a result of natural processes, and are toxic in nature for both humans and wildlife.

Measures that must be taken

The Convention provides that the parties shall manage the chemical stockpiles present with them very cautiously and in such a manner that no harm is caused to either the environment or human health. The Basel Convention states the quantity which an entity can keep with itself at a given time and the procedure to be followed

⁴⁰ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade art. 13, Sept. 10, 1998, 2244 U.N.T.S 337.



³⁹ Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 126.

during disposal of such chemicals. Further, every party must incorporate the spirit of the Convention in its domestic laws, and must take legal and administrative steps to limit the use of the chemicals prescribed under the Convention and restrict the production of the same. Even if a party is contemplating the export of the chemicals, it must ask the entity concerned to furnish the details about the proposed use, and export should only be allowed after the exporting party is satisfied that the purpose is in line with the Convention and adequate steps have been taken for the disposal of the chemicals concerned. Further, since POPs are recognized by the International Agency for Research on Cancer as carcinogenic, their persistent use needs to be decreased and eliminated at a certain point of time in the future.

Eliminating unintentional production

Each party shall endeavor to eliminate not only the intentional production of such hazardous organic compounds but also the unintentional production of these compounds. Also, the parties must strive to promote the production of the alternates or substitutes of the chemicals, if available. Further, the best production model must be used to source the chemicals. When talking about the best, it means "*the application of the most appropriate combination of environmental control measures and strategies*".

Implementation

Article 7 of the Stockholm Convention deals with implementation. It enjoins the parties to the Convention to endeavor to develop a plan for the effective implementation of the Convention. Also, while drafting the implementation plan, the parties, wherever possible, must communicate and learn from the regional and sub-regional organisations. At the same time, they "*must consult their national stakeholders, including women's groups and groups involved in the health of children, in order to facilitate the development, implementation and updating of their implementation plans.*"

Information to the public

The Convention casts a responsibility upon the parties to make all stakeholders aware of their respective policies with regard to the consumption and utilization of the hazardous organic chemicals. Special programmes must be developed for women, senior citizens, children, and the least educated strata of the society to inform these groups adequately about the possible impacts of such organic pollutants on their health and the environment.



Undertaking research

Each party which is in the possession of such harmful chemicals must undertake, at the national and international levels, appropriate research, development, monitoring and cooperation with respect to persistent organic pollutants and, where applicable, to their alternatives and to candidate persistent organic pollutants. Such research must examine their socio-economic and cultural impacts, sources of escape into the environment, and harmonized methodologies for measurement of releases.

Conference of Parties

Article 19 of the Convention deals with the establishment of the "Conference of Parties." The primary purpose of the establishment of Conference of the Parties was for the *continuous review and evaluation of the implementation of this Convention*. The functions of the Conference of the Parties are the establishment of the subsidiary bodies if required, cooperation with national and international organisations, and negotiating with non-governmental and intergovernmental bodies. The Convention mandates that *"The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State not Party to this Convention, may be represented at meetings of the Conference of the Parties as observers"*.

INDIA ON STOCKHOLM CONVENTION

The Department of Chemicals and Petro-Chemicals has been assigned with the task of formulating and implementing the policies related to the organic chemicals in the country, and the development of the country's chemical industry. The Stockholm Convention deals with organic chemicals and their safe disposal globally. India ratified the same in 2006. According to the government,⁴¹ "POPs are chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of living organisms and are toxic to human beings and wildlife. POPs travel globally and can cause damage wherever they travel". Presently, about 21 chemicals are covered under the Convention, out of which the use of Dichloro-diphenyl-trichloroethane (DDT) is restricted in the country. The use of DDT is banned for the purpose of agriculture, is only permitted

⁴¹ Stockholm Convention Ratified by the President, Ministry of Chemicals and Fertilizers https:// chemicals.nic.in/chemical-weapons convention#:~:text=The%20Stockholm%20Convention%2C%20 ratified%20by,Persistent%20Organic%20Pollutants%20(POPs).&text=At%20present%2C%20 twenty%20one%20chemicals,DDT%20is%20restricted%20in%20India (last visited May 18, 2020).

to be produced, with restrictions, for use in vector control, as India has obtained an exemption for the use of DDT for vector control.

Also, the government has already notified the Persistent Organic Pollutants (POP) Rules, 2018 which attempt to ban the manufacturing, trading, use, import and export of the seven toxic chemicals listed under the Stockholm Convention. The Rules require that the entities who are in possession of such hazardous organic chemicals must declare the total quantity of their chemical stockpiles, and are obligated "not to drain or discharge or dispose the chemicals directly or indirectly in effluent treatment plant, sewage treatment plant, onto any land, in public sewers, in inland surface water or in marine coastal areas."

The government has also put restrictions on the manufacturing, trade and sale of certain chemicals proscribed under the Stockholm Convention under the Persistent Organic Pollutants (POP) Rules, 2018.⁴² The Rules also impose a duty upon the occupier of the prohibited chemicals to notify the government about the possession of the said chemicals. The occupier is also mandated to not drain or discharge such hazardous organic chemicals, both directly and indirectly, into any water body/ land/public sewer/any of the marine coastal areas. The chemicals have been placed under the restricted category for any of the activities. The Council for Scientific and Industrial Research laboratories, accredited government institutions, and Ministry of Environment, Forest and Climate Change shall control the import and export of the commodities.

The list of chemicals:

- Chlordecone;
- Hexabromobiphenyl;
- Hexabromodiphenyl ether and heptabromodiphenyl ether (commercial octa-BDE);
- Tetrabromodiphenyl ether and pentabromodiphenyl ether (commercial penta-BDE);
- Pentachlorobenzene;
- Hexabromocyclododecane; and
- Hexachlorobutadine.

⁴² Ministry of Envrionment, Forest and Cliamte Change, G.S.R. 207 (E) (Notified on Mar. 5 2018).

Implementation of Stockholm Convention in other Jurisdictions

This section examines the domestic implementation plans of other countries to achieve the desired objectives of the Stockholm Convention.

USA

In the USA, the use of organic chemicals is allowed for the purpose of organic farming, while the use of synthetic substances is prohibited. A National Organic Advisory Board has been constituted to advice on the inclusion or exclusion of substances. The Advisory Board comprises of several stakeholders including environmentalists, USDA-accredited certifying agents, scientists, organic growers and consumer advocates. While formulating policies, it strictly evaluates the impact of the chemicals on human health and the environment. In some cases, the government has even prohibited natural toxic substances that are used in organic production. The process for allowing or removing a substance from the prohibited list is very transparent, and allows for direct inputs from the Organic Chemicals community.⁴³ The most interesting aspect of this process which is absent in other parts of the world is that before making the decision, public comments are invited to discuss the impacts of the prohibition, and the decision is taken only after the consideration of the public comments. The involvement of stakeholders in the decision-making process, enhances the representativeness of the process.

European Union

Each signatory to the Stockholm Convention which is a member of the European Union is required to formulate an implementation plan "*to show the concrete actions and measures related to the POPs listed in the Convention.*" The implementation plan provides for not only the legal obligations of the country but also an effective and concrete strategy related to the POPs to achieve the objectives enshrined under the Stockholm Declaration. The implementation plan of the European Union aims⁴⁴ to:

- Review the existing Union level measures related to POPs;

⁴³ *Organic 101*, US DEPARTMENT OF AGRICULTURE, https://www.usda.gov/media/blog/archive/tag/organic-101 (last visited May 19, 2020).

⁴⁴ *Persistent Organic Pollutants*, European Commission, https://ec.europa.eu/environment/chemicals/ international_conventions/index_en.htm (last visited May 19, 2020).

- Assess their efficiency and sufficiency in meeting the obligations under the Stockholm Convention;
- Identify the need for further Union level measures;
- Establish a plan for implementing Union level measures;
- Identify and strengthen links and potential synergies between POPs;
- Management and other environmental policies and other policy fields; and
- Increase awareness of POPs and control measures for the same.

Australia

Australia has formulated its own National Plan, which is in congruence with the Stockholm Convention. The Australian National Plan has been developed in pursuance to Article 7 of the Stockholm Convention, which mandates "*each party to develop, and to put into practice, a plan setting out how it will implement its obligations under the Convention.*" The Australian plan aims to achieve the following objectives⁴⁵:

- Reducing the presence of POPs; and
- Meeting its obligations under the Stockholm Convention.

For this purpose, the Country has developed two stakeholders' forums: an intergovernmental forum which will comprise representatives from the Commonwealth, State and Territory government agencies; and a Reference group which shall comprise representatives from the environment, health sector, industry, and companies or individuals interested in POPs.

United Kingdom

United Kingdom also prepared a national implementation plan in 2007. It has been made to evaluate the developments made in the country in light of the Convention, and to outline the steps that need to be taken for the effective management of POPs. The evidence about the functioning of the POPs has been gathered through communications with the industry, the periodical review of scientific journals on emission, and a review of existing inventories for emissions. Since 2007, a multivector inventory has been developed, which will scrutinize POPs which are released

⁴⁵ *Stockholm Convention on Persistent Organic Pollutants (POPs)*, Australian Government, https://www.environment.gov.au/protection/chemicals-management/pops (last visited May 19, 2020).

unintentionally. The multi-vector inventory provides detailed information on the sources of POPs, and is a key part of the UK's assessment capability for further emissions and emission minimization. It shows the emission estimates into air, land and water for all Stockholm Convention substances.⁴⁶

China

China has also developed a National Plan for the implementation of the Stockholm Convention on Persistent Organic Pollutants. It ratified the same in 2004. For achieving the goals of the Convention, the government has prohibited and prevented the production and import of certain chemicals mentioned under the Convention. The government has also resolved to eliminate the production, use, import and export of pesticide POPs; eliminate the releases of unintentionally produced POPs; eliminate releases of POPs from stockpiles and wastes; and "strengthen the environmental monitoring of POPs releases, evaluate impacts of POPs on the environment and human health, and develop or update relevant environmental and hygienic standards".⁴⁷ China is also considering the establishment of a financing mechanism to ensure that the demands for funding to reduce and control POP releases are met.

CONCLUSION

Though significant headways have been made over the past several years to achieve the objectives of the Convention to ensure the safety of human health and environment, much remains to be done. The goal of gradually eliminating the use of chemicals has not been achieved yet, and organic chemicals are still being used by several entities resulting in irreparable harm to both humans and the environment. POPs, once released, remain in the environment for a long period of time, and become widely distributed throughout the environment resulting in the accumulation of fatty tissues in living organisms, including humans. Hence, it is essential to strengthen the regulatory and monitoring mechanisms in order to reduce and eliminate the release of organic chemicals in the environment.

⁴⁷ National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants, The People's Republic of China, http://chm.pops.int/Portals/0/download.aspx?d=UNEP-POPS-NIP-China-1. English.pdf (last visited May 19, 2020).



⁴⁶ National Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (draft), United Kingdom of Great Britain and Northern Ireland,2012, Department of Environment Food and Rural Affairs, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/ attachment_data/file/82680/consult-nip-pop-doc-20121121.pdf (last visited May 19, 2020).

CHAPTER 11

LAWS REGULATING THE PAINT AND DYE INDUSTRY

INTRODUCTION

The paint and dye industry is an important industry in the chemical sector in India and plays a critical role in economic development.¹ Although other industries also rely heavily on chemicals derived from coal tar and petrochemical industry, yet, the paint and dye industry forms a vital link in many other industrial production chains such as that of textile, plastic, paper, printing, construction, interior design, etc.² Paint and dyes are regarded as one of the earliest inventions.³ They are a part of our surroundings and add colors to our lives. Their usage is millenniums old, spanning across continents and civilizations.⁴ However, the modern-day commercial-scale production of paints and dyes commenced during the mid-18th century, at the dawn of the Industrial Revolution. Till that point in time, paints and dyes were made out of natural substances such as Indigo (oldest natural dye), Alizarin (extracted from madder plant), Tyrian Purple (extracted from glands of snails), logwood, etc.⁵ But the production of natural paints and dves was unable to meet the heavy demand created by the Industrial Revolution⁶ and was considered cost-ineffective.⁷ For instance, due to advent of industrialization, the textile sector required large quantities of dyes, which the agrarian sector was unable to produce in a cost-effective manner.⁸

8 Id.

¹ Dyestuff Sector, Doing Business in Maharashtra, http://www.doingbusinessinmaharashtra.org/Dyestuff_ Sector.aspx (last visited Dec. 24, 2020).

² Id.

³ THOMAS J. CRAUGHWELL, 30,000 YEARS OF INVENTIONS (2012).

⁴ *Id*.

⁵ *The Evolution of Textile Dyes: History and Development*, Key COLOUR (Jan. 12, 2016), http://www.keycolour.net/blog/the-evolution-of-textile-dyes-history-and-development/.

⁶ *Id*.

⁷ *Id.* (The onset of industrial revolution revealed the limitations of natural dye production as the scale of natural paint and dye production needed to meet the demand of industrial textile sector would have required vast area of land. Also, the dyes harnessed from nature lacked the consistency and staying power required by the industrialised textile sector).

This enormous industrial demand supplemented by groundbreaking scientific discoveries, such as extraction of aniline and mauve from coal tar,⁹ gave birth to the synthetic paint and dye industry.¹⁰ Using industrial technology, mass and cost-effective production of synthetic paint and dye began on an enormous scale.¹¹ These synthetic paints and dyes were more stable, consistent, and had long-lasting powers than their natural counterparts. The industrial production of synthetic paint and dye was able to meet the huge demand created by painters, artisans, interior designers, and industries alike.¹²

In India, the industrialised manufacturing of paints started in the year 1902 with the establishment of a factory by Shalimar Paints.¹³ Though initially dominated by foreign companies, the Indian paint and dye industry has created a name for itself in the global paints and coatings industry over the years. In India, these industries can be broadly classified into two categories: the *organized* and the *unorganized* sector. The multi-national and big Indian firms together constitute the organized sector whereas the unorganized sector mostly contains the small and medium scale industries.¹⁴ There are two main market segments of the Indian Paint Industry:

- (i) Industrial segment, and
- (ii) Decorative Paints segment.¹⁵

In the industrial segment, paints are primarily used for protection against corrosion and rust on steel structures, vehicles, white goods, and appliances; while the use of decorative paints is meant for building protection and interior and exterior decoration. Over the years, both the segments of the industry have seen a tremendous shift in the preferences of people due to various factors such as the growing popularity of new

⁹ Mark Peplow, *The Reinvention of Black*, NAUTILUS (Aug, 23, 2018), http://nautil.us/issue/63/horizons/ the-reinvention-of-black-rp#:~:text=The%20industrial%20revolution%20had%20found%20its%20 color.&text=The%20industrialization%20of%20the%2018th,color%20would%20come%20t0%20 represent (The extraction of Aniline, a benzene and Amine compound from coal tar by August Hofmann in 1840s and creation of mauve (a deep purple dye) by oxidization of aniline by William Perkin in the year 1856, created the platform for development of synthetic dye industry).

¹⁰ *Id*.

¹¹ *Id*.

¹² Id.

¹³ Devaraj Parthasarathy, *The Indian Paint Industry*, COATINGS WORLD (Oct. 17, 2007), https://www.coatingsworld.com/issues/2007-10/view_features/the-indian-paint-industry/.

¹⁴ Ashok Mohanty et al, *Lead content in new decorative paints in India*, 15 Environment Development and Sustainability 1653 (2013).

¹⁵ Parthasarathy, *supra* note 14.

variants, improved finishing and textures, increasing per capita income, production of odour-free, eco-friendly, water & dust resistant paints etc. Use of dyes is very popular in the commercial sector as the choice of the color of the product directly influences product identity and brand development.¹⁶ There are about 50 manufacturing units of paints and dyes in India in the organised sector and 900 units in the unorganised sector. 90% of the total production of paint and dye happens in the two states of Maharashtra and Gujarat.¹⁷

The paint and dye industry employs a variety of chemicals, however, benzene, toluene, xylene and naphthalene (BTXN) are the basic chemicals used as raw materials in the dye industry.¹⁸ Despite their commercial utility, there have been increasing safety concerns regarding chemicals used in paint and dye in recent times because of the toxicity and adverse environmental impact of commercial scale usage of industrial chemicals.¹⁹ However, complete commercial shift to natural, non-synthetic and 'non-toxic' dyes continues to be a challenge.²⁰ In this context, the present chapter firstly focuses on the various chemicals that are used in the paint and dye sector.

CHEMICALS USED IN THE PAINT AND DYE INDUSTRY

Generally speaking, paint is a "coating" that is applied to any surface in form of a liquid dispersion, which then hardens to form a solid film.²¹The International Organisation of Standardization (ISO) defines paint as "pigmented coating material which, when applied to a substrate, forms an opaque dried film having protective, decorative or specific technical properties".²² Paints are used to serve five functions:

- (i) Protective Function (paints protect the surface from environment and corrosion);
- (ii) Decorative Function (paints provide aesthetic appearance by adding colour and sheen);

²² Paints and Varnishes - Terms and Definitions, art. 2.184, ISO 4618:2014, https://www.iso.org/obp/ ui/#iso:std:iso:4618:ed-2:v1:en (last visited Dec. 24, 2020).



¹⁶ Leire Perez Ibarbia et al, Safety and Regulatory Review of Dyes Commonly Used as Excipients in Pharmaceutical and Nutraceutical Applications, 93 Eur. J. PHARM. Sci. 264 (2016).

¹⁷ Dyestuff Sector, supra note 2.

¹⁸ PLANNING COMMISSION OF INDIA, INDIAN CHEMICAL INDUSTRY, XII FIVE-YEAR PLAN – 2012-2017 (2012), https:// niti.gov.in/planningcommission.gov.in/docs/aboutus/committee/wrkgrp12/wg_chem0203.pdf.

¹⁹ Ibarbia, *supra* note 16.

²⁰ Id.

²¹ Dmitri Kopeliovich, *Classification of Paints*, SUBSTECH, https://www.substech.com/dokuwiki/doku.php?id=classification_of_paints (last visited Dec. 24, 2020).

- (iii)Reflection-Absorption (paints help in absorbing the reflection from heat and light);
- (iv) Changing Surface Properties (paints help in changing the properties of the surface to which they are applied such as anti-friction, hardness, electrical conductivity etc.); and
- (v) Identification (paints help in identifying the product according to the colour).²³

As stated earlier, the paint and dye industry is chemical intensive and it employs a variety of chemicals. The basic chemicals used in the sector are benzene, toluene, xylene, and naphthalene (BTXN). These chemicals serve as basic raw materials for the industry.²⁴ As a mixture, paint has four ingredients: Binders, Solvent, Pigments, and Additives.

Binder

Binder is the main ingredient in paints. It is the "film forming" ingredient of paints.²⁵ It is made of polymers that create a continuous film on the surface to which the paint is applied. Binders are dispersed in a carrier or as colloidal dispersions known as 'vehicle' or 'medium'. The ISO defines a binder as "non-volatile part of a medium".²⁶ Binder holds "pigment particles distributed as required throughout the coating".²⁷ Some of the commonly used binders are:

- Alkyd Resins: They are made by the "condensation polymerization in the reaction of fatty acid and polyols (usually glycerol) with poly basic acids".
- Acrylic Raisins: They are made by polymerization of acrylic or methacrylic esters.
- Latex (PVA): It is a vinyl polymer made by "free radical polymerization of vinyl acetate".

²³ Kopeliovich, *supra* note 21.

²⁴ PLANNING COMMISSION OF INDIA, INDIAN CHEMICAL INDUSTRY, XII FIVE-YEAR PLAN – 2012-2017(2012), https:// niti.gov.in/planningcommission.gov.in/docs/aboutus/committee/wrkgrp12/wg_chem0203.pdf.

²⁵ The Anatomy of Paint: Pigment and Binder, ESSENTIAL VERMEER, http://www.essentialvermeer.com/ palette/palette_anatomy_of_paint.html#:~:text=Artist's%20paint%20consists%20primarily%20 of,not%20alter%20significantly%20in%20time. (last visited Dec. 24, 2020).

²⁶ Paints and Varnishes - Terms and Definitions, art. 2.26, ISO 4618:2014, https://www.iso.org/obp/ ui/#iso:std:iso:4618:ed-2:v1:en (last visited Dec. 24, 2020) (medium/vehicle means all constituents of the liquid phase of a coating material, *Id.* art. 2.156).

²⁷ Dmitri Kopeliovich, *Composition of Paints*, SUBSTECH, https://www.substech.com/dokuwiki/doku.php?id=composition_of_paints (last visited May 28, 2020).

- Phenolic Resins: They are "thermosetting polymers". They are made by "reaction of simple phenol with aldehydes".
- Urethane Resins: Also known as "polyurethanes". They are made by "step-growth polymerization of isocyanates reacting with monomers containing hydroxyl (OH) groups".
- Epoxy Resins: They are also "thermosetting polymers" like Phenolic Resins. They are obtained as a result of "cross linking a resin containing short molecules in the presence of a hardener".
- Chlorinated Rubber: It is made by the "polymerization of degraded natural rubber in the presence of chlorine participating in cross-linking".²⁸

Solvent

Solvent is the "medium where the binder, pigment and additives are dispersed in molecular form (true solutions) or colloidal dispersions (emulsions or sols)."²⁹ The ISO defines solvent as "single liquid or blend of liquids, volatile under specified drying conditions and in which the binder is soluble."³⁰ Binder and Solvent together are known as "vehicle."³¹ Based on the type of solvent used, paints are classified into two groups:

(i) Organic Solvent-borne Paints: The solid constituents in these paints are up to 80%.³² These constituents are dispersed in "an organic solvent"³³ such as Hexane, Benzene, Toluene, Xylene, etc.³⁴ The main advantage of these paints is that they dry fast. However, these paints are highly toxic and prone to combustion.³⁵ These compounds are known as VOCs (Volatile Organic Compounds).

²⁸ Id.

²⁹ Id.

³⁰ Paints and Varnishes - Terms and Definitions, art. 2.237, ISO 4618:2014, https://www.iso.org/obp/ ui/#iso:std:iso:4618:ed-2:v1:en (last visited Dec. 24, 2020).

³¹ *Paints*, The Essential Chemical Industry, https://www.essentialchemicalindustry.org/materials-and-applications/paints.html (last visited May 28, 2020).

³² Kopeliovich, *supra* note 21.

³³ Dmitri Kopeliovich, *Hydrocarbon Solvents*, SUBSTECH, https://www.substech.com/dokuwiki/doku. php?id=hydrocarbon_solvents (last visited Dec. 24, 2020) (Organic Solvents are primarily made of hydrocarbons. They are produced in refinery of crude oil

³⁴ Id.

³⁵ Kopeliovich, *supra* note 21.

(ii) Water-Borne Paints: As the name suggests, they contain water as the primary solvent. Their main advantage is that they are non-toxic and non-combustible. On the other hand, they can take a long time to dry as the evaporation rate of water is very slow.³⁶ In these paints, though water is the primary solvent, but it is not the only solvent. Other solvents contained in water-based paints are Alcohols (n-butanol, isopropanol), glycol ethers, etc. The presence of these additional solvents varies from 5% to 15%.³⁷

PIGMENT

Pigments are solid substances that are scattered throughout the coating. They impart colour and opacity (i.e., hide the substrate of the surface).³⁸ The ISO defines pigments as "colorant consisting of particles, insoluble in the application medium".³⁹ They may be natural or synthetic or organic and inorganic.⁴⁰ Inorganic pigments are made from minerals such as lead white (Lead carbonate PbCO₃).⁴¹ Special pigments can be used to protect the surface, on which the paint is applied, from UV light. Special pigments can also be used in order to change the appearance and other properties of paints such as ductility and hardness.

Commonly Used Pigments	
 Titanium Dioxide (TiO₂) 	Zinc Oxide (ZnO)
 Zinc Yellow, also known as Yellow 36 (Zinc Chromate ZnCrO₄) 	Benzidine Yellows
Chrome Oxide Green	Phthalocyanine Green
Phthalocyanine Blue	Ultramarine Blue
Vermillion (red pigment consisting of Toxic Mercuric Sulphide (HgS)	• Pigment Brown 6 (red inorganic pigment based on Iron III Oxide Fe ₂ O ₂)
Red 170 (Used in automotive industry)	Carbon Black
Iron (II) Oxide	

TABLE - 1

³⁶ Id.

³⁷ Id.

³⁸ Kopeliovich, *supra* note 27.

³⁹ Paints and Varnishes - Terms and Definitions, art. 2.193, ISO 4618:2014, https://www.iso.org/obp/ ui/#iso:std:iso:4618:ed-2:v1:en (last visited Dec. 24, 2020).

⁴⁰ *Production and Use of Paint Products*, available at https://www.ncbi.nlm.nih.gov/books/NBK524825/ (last visited May 28, 2020).

⁴¹ The Anatomy of Paint: Pigment and Binder, supra note 25.
Additives

Additives are substances that are added in small amounts to the paint and dye to modify its properties. The ISO defines additive as "any substance, added in small quantities to a coating material, to improve or otherwise modify one or more properties".⁴² Properties improved by addition of additives in paints are –accelerated drying, increased flexibility, fungus & bacterial protection, air bubble formation prevention, UV light stability, reduced corrosion rate, imparting textures, etc. They contribute about 5-7% of the total plastic weightage and approx. 10% by total cost of paints.⁴³

COMMONLY USED ADDITIVE	S ⁴⁴				
Wetting/Dispersing	Alkylphenol ethoxylates (APEO), Block copolymers, Sulfates, Sulfonates, Phosphate salts and esters, Polyether amine, Aromatic ethoxylates, etc.				
Rheological (Viscosity) Modifiers	Hydrophobically modified Alkali-Swellable Emulsions (HASE), Hydrophobically modified Ethoxylate Urethanes (HEUR), Fumed silicas, Organo clays, Cellulosics, etc.				
Foam Control	Cellulose Acetate butyrates, Benzoin, Mineral Oil, Polysiloxines, Mineral Spirits, etc.				
Catalysts	Organic peroxides, Sulphonic acids, carboxylic acids, phosphoric acids, Dibutylin dilaurate (DTBL), Dibutylin Diacetate (DBTDA), 1,4-diazabicylo [2.2.2.]octane (DABC), etc.				
Driers	Metal Carboxylates (e.g., napthenates, neodecanoates, octoates), Iron ligands, etc.				
Coalscents	Propylene glycol, Benzoates, Texanol, etc.				
Coating Surface Modification	Waxes, Polymethyl Urea, Polyethers, etc.				
Adhesion Promoters	Titnates, zirconates, etc.				
Biocides	Isothiazolinones, Guanides, Benzimidazoles, Phenols, Carbamates, etc.				
Stabilizers	HALS, Benzotriazoles, Barium, Zinc, Bisphenol, etc.				
Plasticizers	Phthalates, epoxidized soybean oil, etc.				

TABLE - 2

42 Paints and Varnishes - Terms and Definitions, art. 2.6, ISO 4618:2014, https://www.iso.org/obp/ ui/#iso:std:iso:4618:ed-2:v1:en (last visited Dec. 24, 2020).

43 FICCI, Knowledge and Strategy Paper on *Specialty/Fine/Agro/Personal Care Chemicals/Dyes/ Colorants & Pigments* (2013), http://ficci.in/spdocument/20325/India%20chem.pdf.

44 Additive for Paints and Coatings: Current State and Future Dynamics, PAINT AND COATING INDUSTRY (PCI), https://www.pcimag.com/articles/107494-additives-for-paints-and-coatings (last visited Dec. 24, 2020).

CONCERNS WITH CHEMICALS USED IN THE PAINT AND DYE INDUSTRY

The wide use of chemicals in the paint and dye industry poses many challenges such as environmental pollution, toxicity, health problems, and safety risks. Despite their extensive use in both domestic and industrial sectors, the basic fact is that paints and dyes are essentially a toxic mixture of various chemicals and compounds including organic solvents, cadmium, chromium, mercury, and lead. The basic elements of paints and dyes, i.e., Benzene, Toluene, Xylene and Naphthalene (BTXN) have adverse health impacts. Benzene is classified as Group A carcinogen (cancer causing) substance.⁴⁵ In addition to that, its long-term inhalation is known to cause blood disorders such as aplastic anaemia and a reduction in the number of red blood cells. Xylene and toluene, though not classified as carcinogens, have severe health impacts such as dysfunction of central nervous system, respiratory, kidney and cardiovascular issues.⁴⁶ Naphthalene exposure may result in haemolytic anaemia, liver and neurological damage, damage to retina. It has also been classified as Group C carcinogen.⁴⁷

Volatile Organic Compounds (VOCs) emission is another area of major concern in the paint industry. These carbon-based compounds, which are emitted as gases from various chemicals used in paints, contribute the most to indoor air pollution and its effect may last up to five years, which may, in turn, have both short-term as well as long-term adverse effects on one's health such as cancer, breathing difficulties, etc. These chemicals vaporize at room temperature and their concentration is higher in the indoor environment as compared to the outdoor environment.⁴⁸

The heavy metals used in paints pose harm as they diffuse their residues in indoor environments which remain persistent over a long period. Direct or indirect exposure to these chemicals and metals may result in long-term effects on a person's health. Lead is a highly toxic metal. Despite this, lead compounds, such as lead chromate (chrome yellow), lead oxide (red lead), lead carbonate (white lead), have been commonly used in household paints for a long time. These compounds are added to the paints as pigments and additives to provide them with certain properties like

⁴⁵ Kopeliovich, *supra* note 27.

⁴⁶ Id.

⁴⁷ *Naphthalene*, EPA, https://www.epa.gov/sites/production/files/2016-09/documents/naphthalene.pdf (last visited Dec. 26, 2020).

⁴⁸ *Volatile Organic Compunds' Impact on Indoor Air Quality*, EPA, https://www.epa.gov/indoor-airquality-iaq/volatile-organic-compounds-impact-indoor-air-quality (last visited Dec. 26, 2020).

colour, shine, durability, faster drying time, and reduced corrosion, etc. Lead-based additives are mostly used in solvent-based paints because of their certain chemical properties and are widely used across various countries. Lead paints pose serious risks to human health as well as the environment since they remain toxic for many years. As dried off paints begin to decay, their dust spreads in the surroundings. This dust remains toxic for a long period, due to which there are high chances of it being readily inhaled or ingested in the body through direct or indirect contract. Excessive and prolonged exposure to lead causes lead poisoning.⁴⁹ Further, a higher trace level of lead in the body can cause convulsions; induce reproductive problems in both men and women; cause digestive and high blood pressure, nerve disorders; and in worst cases coma and even death. Efforts are being made by all major pigment manufacturers to offer alternatives to lead-based pigments. Some of the shades which contain lead are red, vellow, and orange, and the alternate pigments are now being developed for the same.⁵⁰ Increased public awareness, political pressure have led the developed countries such as US, UK, and Germany to take pro-active steps to deal with the issues of lead poisoning through paints. The use of lead in paints is prohibited in several countries, while in others, very stringent limits are being set on the content of lead in paints. However, developing countries do not have a stringent mechanism for regulating the use of lead in paints.⁵¹ In India, despite governmental regulation, lead is being readily used in paints by the unorganised sector paint industries.⁵²

Another concerning area in the paint and dye industry is the use of Azo-based dyes such as dinitroaniline, ortho-nitroaniline, etc. These dyes, which are often used in the colouring process of textiles and leather, can release certain aromatic chemicals that pose cancer risks.⁵³ In particular, exposure to azo dyes derived from benzidine is known to cause bladder cancer.⁵⁴ For this reason, the European Union (EU) has passed a legislation to prevent exposure to such hazardous chemical substances

⁵⁴ Id.



⁴⁹ Tripti Arora et al, *How safe is your paint: Compliance of Lead in Paint regulations in India*, Toxics Link (2020), http://toxicslink.org/docs/How%20safe%20is%20your%20paint.pdf.

⁵⁰ MINISTRY OF ENVIRONMENT & FORESTS, TECHNICAL EIA GUIDANCE MANUAL FOR INTEGRATED PAINT INDUSTRY(2010), http://environmentclearance.nic.in/writereaddata/form-1a/homelinks/TGM_Integrated%20 paints_160910_noPW.pdf.

⁵¹ *Fact Sheet 15 - Paints: Colours discolouring lives*, Toxics Link (2005) http://toxicslink.org/docs/lead_in_paints/factsheetonpaint_25_Paints_eng.pdf.

⁵² Mohanty, supra note 14.

⁵³ Eva Engel et al, *Azo Pigments and a Basal Cell Carcinoma at the Thumb*, 216 DERMATOLOGY 76 (2008); Klaus Golka et al, *Carcinogenicity and Azo Colorants: Influence of Solubility and Bioavailability*, 151 TOXICOLOGY LETTERS 203 (2004).

and put the prohibition on the use of certain azo dyes.⁵⁵ Prior to this ban in the EU, approximately 20% of all dyes used in the Indian textile industry were azo dyes.⁵⁶

A major challenge being faced by the paint and dye industry right now is the development of eco-friendly additives. Due to increasing demand for eco-friendly products and enforcement of regulations such as REACH, the manufacturers and companies are compelled to adopt eco-friendly techniques and products. REACH (EC1907/2006)⁵⁷ is a regulation of the European Union (EU) which aims at human health and environment protection through the prevention and identification of the toxic properties of chemicals. All this is managed and done by the four key processes of REACH, viz, registration, evaluation, authorization, and restriction of chemicals. It also works towards innovation and competitiveness of the EU chemical industries. The following table provides a brief analysis of certain other chemicals used in the paint and dye industries and their health and environmental impacts.

Public Health and Environmental Impact of Chemicals used in Paints ⁵⁸						
Toxic Chemicals	Properties	Possible Health and Environment Effects	Application			
Formaldehydes and formaldehyde releasers (e.g.,benzylhemiformal, 2-bromo-2-nitropropane- 1,3-diol, 5-bromo-5-nitro- 1,3-dioxane, diazolidinyl urea, Imidazolidinyl urea, Quaternium-15, DMDM Hydantoin)	Antibacterial, Preservative	Irritates mucous membranes and skin, can cause hypersensitivity, carcinogenic (nasal pathway)	In many types of glues, lubricants and paints, plywood, particleboards furniture, laminate, textiles and leather			

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⁵⁵ Id.

⁵⁶ ENVIRONMENTAL MANAGEMENT CENTRE, SECTORAL GUIDANCE MANUAL SERIES: CLEANER PRODUCTION IN THE DYES AND DYE INTERMEDIATE INDUSTRIES (2012) http://www.gcpcenvis.nic.in/Manuals_Guideline/CP_In_Dyes_n_Dye_Intermediate.pdf.

⁵⁷ Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), Regulation (EC) No. 1907/2006, https://osha.europa.eu/en/legislation/directives/regulation-ec-no-1907-2006-of-the-european-parliament-and-of-the-council (last visited Dec. 26, 2020).

⁵⁸ What is Important to Know About Paints and Varnishes?, NoNHAZCITY, https://nonhazcity.avanestra.ee/ en/consumer/indoor-paints-varnishes/ (last visited Dec. 26, 2020).

Nonylphenol (ethoxylates)	Surfacant	Endocrine disruptor; persistent, accumulates in the environment	Textile paper and pulp processing, paints, resins, glue, protective coatings, detergents, animal medicine, pesticides, steel production
Organic solvents (Xylene, benzene (turpentine), n-hexane, hydro-treated heavy naphtha, ligroin, naphtha (petroleum), hydrodesulfurized heavy)	Solvents, detergents, medicine, anti- freeze	Harmful to reproduction, unborn child, causes skin irritation and eczema	Plaster paints, acrylic paints, enamel, wood varnish, glue, resins, detergents, paint and varnish remover, hydrolic liquids
PVC	Synthetic material, soft or rigid, applied for many uses	8-16 substances in PVC can cause different types of damage, such as dipentylphthalate (carcinogenic, toxic, disrupting the reproductive system, CMR, damaging to the unborn child) cadmium, lead and vinyl chloride (carcinogenic, on combustion dioxin is released	Piping, textile (t-shirts) gloves, (building) plastics, toys
Brominated flame retardants	Slows the combustion process by several minutes	PBT, some kinds are also classified as CMR, some disrupt the hormone system	Polystyrene, textile (furniture fabrics), stuffing of furniture and mattresses wrappings, insulation materials, plastics
Biocides (diuron, 5-chloro- 2-methyl-4-isothiazolin-3- one)	Intended to kill, deter or render harmless organisms (plants and animals) considered harmful	Toxic to living organisms, skin irritation, burns, allergies	Wood and wood products, fungicidal paint, etc

Bisphenol A	Component in formulation of epoxy resins, formerly also used as a fungicide	Endocrine disruptor, possible reprotoxic effects, is irritating to eyes, lungs and skin	Plastics, resins, epoxy glues
Additives in paints (Cobalt bis (2-ethylhexanoate), ethyl methylketoxime, 2-butanone oxime, zinc phosphate)	Anti-skinning, thickening agents in paints	Irritant to skin, eyes, respiratory system, possible carcinogen, hazardous to the environment	Paints, primer, especially organic solvent-based
Isocyanates	Stabilising agents, enhancing adhesion	Irritating to eyes and respiratory tract	Used in production of rubbers and adhesives

Applicability of International Chemical Conventions to Paint and Dye Industry

This section of the Chapter focuses on the applicability of the international chemical conventions dealing with the management and regulation of chemicals used in Paint and Dye Industry. The major conventions discussed are Basel Convention, Stockholm Convention, Rotterdam Convention, Minamata Convention, SAICM and REACH Framework.

BASEL CONVENTION

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal⁵⁹ is an international instrument, negotiated at the city of Basel, Switzerland and entered into force in 1992, primarily laying down provisions for regulation, management and disposal of hazardous waste through transboundary trade and movement. The Annex I, item Y12 provides for the control of wastes from the production, formulation and use of inks, dyes, pigments, paints, lacquers, varnishes.⁶⁰ Annex VIII of the Basel Convention⁶¹ contains List A. It enumerates wastes that are categorised as hazardous under Article 1(1)(a) of the Convention. The chemicals waste listed under this list can still be precluded from the scope of the Convention if they satisfy the test laid down in Annex VIII to demonstrate that they

⁶¹ The amendment by which Annex VIII was added to the Basel Convention came into force on Nov. 6, 1998.



⁵⁹ The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Mar. 22, 1989, 1673 U.N.T.S. 57 [hereinafter the Basel Convention].

⁶⁰ *Id.* Annex I, Y12.

are not hazardous. Sub-list A1 under entry A1010 mentions metal waste and waste containing alloys of, *inter alia*, Cadmium, Lead, and Mercury.⁶² Compounds of these metals are widely used in the paint and dye industry. Further, sub-list A4 that deals with "wastes which may contain either inorganic or organic constituents" under item A4070 specifically mentions waste that results from the "production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish."⁶³

Annex IX of the Basel Convention⁶⁴contains List B. This list enumerates wastes and chemicals which will not be considered as wastes for the application of the Basel Convention under Article 1(1)(a) of the Convention.⁶⁵ Under the Annex, Sub-list B3 under item B3010 refers to "cured wastes resins such as epoxy resins and alkyd resins".⁶⁶ Further, under sub-list B4 of the Annex IX item B4010 refers to "wastes from water-based, latex paints, inks and hardened varnishes."⁶⁷

From the above, it is clear that the paint and dye industry has to comply with the various requirements of the Basel Convention while dealing with the waste generated by them. These include environmentally-sound waste management under Article 4, Written Prior Consent procedure under Articles 6 and 7, information transmission under Article 13, continuous review and evaluation of effective implementation under Article 15 at the Conference of the Parties, etc.

STOCKHOLM CONVENTION

The Stockholm Convention on Persistent Organic Pollutant (POPs), which entered into force on May 17, 2004, is another major international treaty focusing on the elimination and restriction of various persistent organic pollutants (POPs) to protect human health and environment.⁶⁸ The Convention mandates the elimination of the chemicals mentioned in Annex A, including their production, use, import and export. Further, it also prescribes restrictions on the production and usage of chemicals mentioned under Annex B. However, the Convention permits a State Party to register exemption for the continuous use of these chemicals.

⁶⁸ The Stockholm Convention on Persistent Organic Pollutant art. 1-3, May 22, 2001, 2256 U.N.T.S. 119.



⁶² The Basel Convention, Annex VIII, A1010.

⁶³ *Id.* Annex VIII, A4070 (however wastes that are specified under list B of Annex IX are exempted from the applicability of Annex VIII).

⁶⁴ The amendment by which Annex IX was added to the Basel Convention came into force on Nov. 6, 1998.

⁶⁵ Unless these wastes contain Annex I materials in such quantity so as to cause them exhibit Annex III characteristics. *See*, The Basel Convention, Annex IX.

⁶⁶ The Basel Convention, Annex IX, B3010.

⁶⁷ Id. Annex IX, B4010.

The Convention is important for the paint and dye industry from two important aspects. First, short-chain chlorinated paraffins, a set of chemicals that is used for the development of waterproof and fire-retardant paints, is covered under Part I of the Annex A of the Convention.⁶⁹ Perfluorooctane sulfonic acid (CAS No. 1763-23-1), its salts and perfluorooctance sulfonyl fluoride, a chemical that is used as an additive for photo-resistant and anti-reflective coatings, is covered under Part I of the Annex B of the Stockholm Convention.⁷⁰Though both these chemicals are listed under Annex A and Annex B respectively, their use is exempted for the paint and dye industry under the Convention.

ROTTERDAM CONVENTION

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade is a major international convention for the management and regulation of hazardous chemicals in the arena of international trade. It is designed for the promotion of principles such as "shared responsibility" and "co-operative efforts" among Parties in the international trade to regulate the trade of hazardous chemicals.⁷¹ Annex III of the Convention provides a list of chemicals that are subject to the prior informed consent procedure as laid down in the Convention. The list contains Perfluorooctane sulfonic acids, short-chain chlorinated paraffins,⁷² which are used as additives in the paint industry for producing photo-resistant, antireflective, waterproof and fire-retardant paint and coatings. Thus, the paint and dye industry is mandated to comply with the Prior Informed Consent Procedure under the Convention, about import and export of these chemicals.

MINAMATA CONVENTION

The Minamata Convention on Mercury is one of the major international environmental agreements of the 21st Century intended to address the need to protect human health and the environment from emissions of mercury and its compounds.⁷³ Mercury and its compounds are used in the paint and dye industry for creating anti-bacterial and

72 Id. Annex III.



⁶⁹ Id. Annex A, Part I.

⁷⁰ Id. Annex B, Part I.

⁷¹ The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade art 1, Sept. 10, 1998, 2244 U.N.T.S. 337.

⁷³ The Minamata Convention on Mercury art. 1, Oct. 10, 2013, C.N.560.2014.

anti-fungal paints as these compounds are efficient biocides and anti-fouling agents. Vermillion, a derivative of Cinnabar (Mercury Sulphide (HgS)), is a red pigment used in the paint industry. Both these compounds are covered under the Minamata Convention. The definition of mercury compounds under Article 3 of the Convention, which focuses on mercury supply sources and trade, includes both cinnabar and mercury sulphide.⁷⁴ Article 3 prescribes that each party to the Convention should identify individual stocks of mercury compounds that exceed 50 metric tons that are located within its territory.⁷⁵ It prohibits the parties to export mercury without written consent and mandates that mercury will only be used for purposes set out in the Convention or undertake environmentally-sound interim storage as prescribed under Article 10.⁷⁶ The Convention further provides that each importing party shall not import mercury from a non-party unless the non-party provides a certificate that the mercury imported is not obtained from a source that is not allowed.⁷⁷

SAICM

The Strategic Approach to International Chemicals Management (SAICM) is a policy framework that is intended to promote chemical safety at the international level. Under the framework, the ICCM (i.e., International Conference on Chemicals Management) is required to call for taking appropriate action on "emerging policy issues".⁷⁸ The use of lead in paint has been identified as one of the eight emerging policy issues under SAICM. The ICCM2 in 2009 advocated for a "global partnership to promote the phasing out of lead paint". This partnership is known as Global Alliance to Eliminate Lead Paint (Lead Paint Alliance (GAELP)) is a joint partnership between SAICM, UNEP, and WHO secretariats.⁷⁹ The objective of this alliance is to promote a "phase-out" of the production and sale of lead paints to eliminate risks associated with lead paints.⁸⁰ In 2017, it came out with a Model Law and Guidance for Regulating Lead

⁷⁴ Id. art. 3(1)(b).

⁷⁵ Id. art. 3(5)(a).

⁷⁶ *Id.* art. 3(6), 10 (Art. 10 requires each party to undertake measures for ensuring that the interim storage of mercury and its compounds is undertaken in environmentally sound manner, taking into account any guidelines set out by the Conference of the Parites).

⁷⁷ Id. art. 3(8).

⁷⁸ Strategic Approach to International Chemicals Management (SAICM) ¶ 24.j.

⁷⁹ UNEP, UPDATE ON THE GLOBAL STATUS OF LEGAL LIMITS ON LEAD IN PAINTS (2019). See also, Lead in Paints, SAICM, https://www.saicm.org/Implementation/EmergingPolicyIssues/LeadinPaint/tabid/5472/lang uage/en-US/Default.aspx (last visited Dec. 26, 2020).

⁸⁰ Id.

Paint, which was revised in 2018.⁸¹ This model law contains provisions for setting up legal limits on total lead content (90 ppm by weight), phasing out 1 year, declaration of conformity based testing by 3rd party laboratory, governmental inspections. The model law also has provisions for criminal and civil remedies. It criminalises certain acts such as the manufacture, sale, distribution, import of paint which contains lead content in excess of 90 ppm, failure or refusal to permit entry for inspection, failure to furnish conformity declaration, the exercise of undue influence on third party laboratory. The exact quantum of punishment is left for the member countries to decide. On the civil side, it advocates for incorporating provisions of injunctive relief, seizure and citizen suits.⁸²

GAELP has also suggested steps for establishing a Lead Paint Law.⁸³ These suggested steps include:

- Stakeholder Engagement: to gain support for a lead paint law, identification of relevant government ministries or ministers and conduction of meetings are suggested.
- Development of a Lead Paint Law: It suggests an assessment of options for the development of a lead paint law by reviewing the current regulatory framework by required authorities to regulate lead in paint, the designation of the lead agency which will draft legal limitations for lead paints, facilitation of legal drafting by establishing a drafting coordinating group, development of draft law, conduction of public review process and then, the promulgation of the law.
- Awareness Raising: It suggests raising awareness for the promotion of lead paint law by identifying appropriate target audiences and conduct awareness raising on various topics such as adverse health, societal and economic impacts of lead paints, sustainable action to eliminate lead in paint etc.⁸⁴



⁸¹ GAELP et al, Model Law and Guidance for Regulating Lead Paints, 2018 https://wedocs.unep.org/ bitstream/handle/20.500.11822/22417/Model_Law_Guidance_%20Lead_Paint.pdf?sequence=7 (last visited Dec. 26, 2020).

⁸² Id.

⁸³ GAELP ET AL, SUGGESTED STEPS FOR ESTABLISHING A LEAD PAINT LAW (2019), https://www.saicm.org/ Portals/12/Documents/EPI/Lead%20Paint/SuggestedStepsEstablishingLeadPaintLaw.pdf.

⁸⁴ Id.

Reach Framework

Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) is a European Union Regulation adopted in 2006.85 It is regarded as one of the strictest laws focusing on chemical regulation and management. From the perspective of the paint and dye industry, the Regulation, under Annex XVII places restrictions on chemicals such as Benzene, lead carbons including lead carbonate, cadmium, toluene, organostannic compounds. These chemicals are used in paints for various purposes. It prohibits the use of benzene in a concentration in excess of 0.1% in substances placed in the market. It prohibits the use of lead carbonate in paints except for restoration and maintenance of artistic works and historic buildings. However, a member state under the Regulation has the flexibility to permit usage of lead carbonates as per the provisions of ILO Convention on the Use of White Lead and Sulphates of Lead in paint. The Regulation also prescribes that cadmium shall not be used to give colour to the paints. However, if the paint contains zinc content, then, the quantity of cadmium in those paints shall not exceed 0.1% and shall be as low as possible. With regard to toluene, the framework mandates that it should not be used in paints (that are intended for sale to the general public) in excess of 0.1% concentration by mass. REACH also prohibits the use of organostannic compounds as biocides in paints.⁸⁶

REGULATORY FRAMEWORK FOR PAINT AND DYE INDUSTRY IN INDIA

In India, there is no comprehensive legislation regulating the use of chemicals in the paint and dye industry specifically. Instead, the use of chemicals in the industry is regulated under a plethora of legislations, rules and regulations. The first set of rules and standards describing the use and risks of the toxic compounds in paints were laid down in the year 1995⁸⁷ but unfortunately, these standards were not effectively implemented.⁸⁸ These standards were laid down by the Bureau of Indian Standards (BIS). They were volunteer standards required to be fulfilled to obtain the eco-mark for architectural paints and powder coatings. They set the limit at 1000 ppm.⁸⁹

⁸⁵ Regulation, Evaluation, Authorization and Restriction of Chemicals (REACH), Regulation (EC) No. 1907/2006.

⁸⁶ REACH, Annex XVII.

⁸⁷ Bureau of Indian Standards, Ecomark Criteria, 1995.

⁸⁸ Fact Sheet 15 - Paints: Coloursdiscolouring lives, surpa note 51.

⁸⁹ *Paints in India have unacceptable levels of toxic lead*, Centre for Science and Environment (August 17, 2009), https://www.cseindia.org/paints-in-india-have-unaceptable-levels-of-toxic-lead-7536.

The standards for lead content in paint were revised in 2013. The IS 133 (Part 1): 2013 (for Enamel, Interior: (a) undercoating (b) finishing. Specification Part 1 for Household and Decorative Purposes) sets the lead content limit to 90 ppm. These voluntary standards require steps such as precautionary labelling including information on the maximum lead content. Further, IS 133 (Part 2): 2013 deals with paints used for commercial and industrial applications. The voluntary standard requirements laid down by BIS are enforced under the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The standards limit set by BIS are amongst the lowest in the world, and on par with the standards set by the "Model Law and Guidance for Regulating Lead Paint."⁹⁰ Other counties such as the USA, Canada, Israel, and China also have the same 90 ppm limit.⁹¹

To further strengthen the Indian legal regime to regulate lead content in paints, the Ministry of Environment, Forest and Climate Change notified the Regulation of Lead Contents in Household and Decorative Paints Rules, 2016.92 These Rules came into force from November 1, 2017. Rule 3 prohibits the manufacture, trade, import and export of household and decorative paints that exceeds the threshold limit of 90ppm.⁹³Rule 4 prescribes for "self-certification". Under this Rule, it is mandatory that household and decorative paints, either manufactured or imported, should be labelled stating that the lead content in the paint is not in excess of 90 ppm. Such labelling should not only be durable and legible but should also contain the name and address of manufacturer and importer and the date of manufacture or import.⁹⁴Also, the manufacturers and importers must get their products tested once a year before putting them in the supply chain, as per these Regulations. These Rules also set a 2 year window for the sale of the paints manufactured before the commencement of the legislation till November 2017.95 The Central Pollution Control Board (CPCB) is the nodal agency for the implementation of the Rules and it should prepare the compliance and testing procedure.⁹⁶

96 *Id.* Rules 5, 7.

⁹⁰ GAELP, supra note 81.

⁹¹ GAELP ET AL, UPDATE ON THE GLOBAL STATUS OF LEGAL LIMITS ON LEAD IN PAINTS (2019), http://www.saicm.org/ Portals/12/Documents/EPI/Lead%20Paint/2019_Global_Update-final.pdf.

⁹² Regulation of Lead Contents in Household and Decorative Paints Rules, 2016 (the Rules were framed by MoEF&CC under the powers given by Section 3(1) and Section 6(2)(d) of the Environment (Protection) Act, 1986 read with Environment (Protection) Rules, 1986, Rule 13.

⁹³ Regulation of Lead Contents in Household and Decorative Paints Rules, 2016, Rule 3.

⁹⁴ Id. Rule 4.

⁹⁵ Id. Rule 8.

Under the mandate of the 2016 Rules, the CPCB notified the "Compliance and Testing Procedure for Measurement of Lead Contents in Household and Decorative Paints" on 31st October, 2017. This document laid down the applicability, requirements, and testing procedure for regulation of lead content in household and decorative paints in India. The document provides details on the assessment of existing and new paints while also providing the sampling and testing protocol. It also entails the procedure for analysis of lead in paint and prescribes accredited labs for testing, implementation, and monitoring.⁹⁷ Household and Decorative Paints are defined as "Paint used as surface coating materials in interior and exterior of buildings, walls, civil structures, any consumer products meant for household purposes and shall include enamel, primer, interior, undercoating and finishing colouring materials as prescribed in the Indian Standards for Household and Decorative Paints by the Bureau of Indian Standards".⁹⁸ It limits the lead content in paints to 90 ppm and prohibits the manufacture, trade, import, export of paints that exceed the prescribed limit.⁹⁹

Apart from the above, a plethora of legislations, rules and regulations govern the paint and dye industry in India. The following table may be referred to consider the major environmental legislations applicable to the integrated paint industry in India:

	Legislations Regulating the Paint and Dye Industry ¹⁰⁰					
S. No.	Legislation	Chemical Use Categories/ Pollutants	Relevant Provisions			
1. Air (Prevention and		Air pollutants from	Section 21: Consent from State Boards;			
	Control of Pollution) Act, 1981 amended 1987) chemical industries 987	Section 22: Not to allow emissions exceeding prescribed limits;			
			Section 24: Power of Entry and Inspection;			
			Section 25: Power to Obtain Information;			
			Section 26: Power to Take Samples;			
			Sections 37-43: Penalties and Procedures;			

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98 *Id.* at 3, ¶ 1.

⁹⁷ CENTRAL POLLUTION CONTROL BOARD (CPCB), COMPLIANCE AND TESTING PROCEDURE FOR MEASUREMENT OF LEAD CONTENTS IN HOUSEHOLD AND DECORATIVE PAINTS (2017), https://www.ipaindia.org/resources/ ProcedureforMeasurementofLeadContentinPaints_31stOct17.pdf.

⁹⁹ *Id.* at 4, ¶ 2.

¹⁰⁰ Information within this table has been borrowed from the Ministry of Environment and Forests, Government of India Technical EIA Guidance Manual for Integrated Paint Industry (2010).

	2.	Air (Prevention and Control of Pollution) (Union Territories) Rules, 1983	Air pollutants from chemical industries	Rule 9: Consent Applications	
3. The Environment (Protection) Act, 1986, amended 1991		The Environment (Protection) Act, 1986, amended 1991	All types of environmental pollutants	Section 7: Not to allow emission or discharge of environmental pollutants in excess of prescribed standards	
				Section 8: Handling of Hazardous Substances	
				Section 10: Power of Entry and Inspection	
				Section 11: Power to take samples Sections 15-10: Penalties and Procedures	
	4.	Environmental	All types of	Rule 3: Standards for emission or	
		(Protection) Rules, 1986 (Amendments in 1999,	Pollutants	discharge of environmental pollutants	
		2001, 2002, 2002, 2002, 2003, 2004)		location of industries and the carrying on process and operations in different areas	
				Rule 13: Prohibition and restriction on the handling of hazardous substances in different areas	
				Rule 14: Submission of environmental statement	
	5.	 Hazardous Waste (Management and Handling) Rules, 1989 Management and Handling of hazardous wastes in 		Rule 4: Responsibility of the occupier and operator of a facility for handling of wastes	
		amended 2000 and 2003	line with the Basel Convention	Rule 4A: Duties of the occupier and operator of a facility	
				Rule 4B: Duties of the authority	
				Rule 5: Grant of authorization for handling hazardous wastes Rule 6: Power to suspend or cancel authorization	
				Rule 7: Packaging, labelling and transport of hazardous wastes	
				Rule 8: Disposal sites	
				Rule 9: Record and returns Rule 10: Accident reporting and follow up	
				Rule 11: Import and export of hazardous waste for dumping and disposal	
				Rule 12: Import and export of hazardous waste for recycling and reuse	
				Rule 13: Import of hazardous wastes	
				Rule 14: Export of hazardous waste	
				Rule 16: Liability of the occupier	
				transporter, and operator of a facility	

				Rule 19: Procedure for registration and renewal of registration of recyclers and re-refiners Rule 20: Responsibility of waste generator
Ì	6.	Manufacture Storage	Hazardous	Rule 4: Responsibility of the Occupier
		and Import of	Chemicals -	Rule 5: Notification of Major Accidents
		Rules, 1989 amended	Flammable,	Rules 7-8: Approval and notification of site and updating
		2000		Rules 10-11: Safety Reports and Safety Audit reports and updating
				Rule 13: Preparation of Onsite Emergency Plan
				Rule 14: Preparation of Offsite Emergency Plan
				Rule 15: Information to persons likely to get affected Rule 16: Proprietary Information
				Rule 17: Material Safety Data Sheets
ļ				Rule 18: Import of Hazardous Chemicals
	7.	EIA Notification, 2006	For all the identified developmental activities in the notification	Requirements and procedure for seeking environmental clearance of projects
	8.	Public Liability Insurance Act, 1991	Hazardous Substances	Section 3: Liability to give relief in certain cases on principle of no fault
		amended 1992		Section 4: Duty of owner to take out insurance policy
				Section 7A: Establishment of Environmental Relief Fund Sections 14- 18: Penalties and Offences
	9.	Public Liability Insurance Rules, 1991	Hazardous Substances	Rule 6: Establishment of administration of fund
		amended 1993		Rule 10: Extent of liability
				Rule 11: Contribution of the owner to environmental relief fund

For the growth of the chemical sector, the Planning Commission, in March, 2011 in the XII Five Year Plan of the Indian Chemical Industry (2012 - 2017), constituted a Working Group on chemicals and petrochemicals for identification of its longterm goals and formulation of future road-map and strategies for the same. Also, some measures were identified, by the Commission, to strengthen the Research & Development (R&D) in the Indian Chemical Sector. The XII Five Year Plan includes the aim of introducing mandatory use of lead-free pigments and coatings in all applications.¹⁰¹ Various industry associations were consulted before the Working Group submitted its Report to the Planning Commission in September, 2011. This Report recommended formulating a National Chemical Policy and on the basis of this Report, a draft policy for the same was prepared which indicated various mechanisms and steps necessary for the growth of the chemical sector in India.¹⁰² To make the country an important market hub, both domestically and internationally, the government decided to attract major investment by providing a transparent and fair investment-friendly policy under which integrated Petroleum, Chemicals and Petrochemical Investment Regions (PCPIRs) may be set-up. This PCPIR policy, if implemented in the ideal and appropriate manner, will boost the development of both the Chemical Industries and the Nation as well.¹⁰³

In the XII Five-Year Plan, 2012-2017, the Planning Commission of India had expressed the necessity to improve consumption standards in India in order to improve the standard of living in the society and to enhance the safety of consumers.¹⁰⁴ As the Indian economy develops, India will require a more stringent and strengthened regulatory regime. According to the Planning Commission, a strengthened regulatory regime will help in promoting and increasing the usage of specialty chemicals.¹⁰⁵ The developed countries like the US and Germany have adopted very strict standards for the use of solvents in paints and for limiting the amount of Volatile Organic Compounds (VOCs) in paints.¹⁰⁶ However, in India, paints and dyes are still manufactured with high VOCs content.¹⁰⁷ Since a complete overhaul in manufacturing process, such as manufacturing of lead-free paints, will be very capital-intensive, the Planning Commission recommended the establishment of a Technology Up-Gradation Fund (TUF) which will help in addressing technology-specific issues faced by the industry. The SME sector will benefit immensely from this fund as it would help in facilitating

¹⁰¹ Planning Commission of India, $supra\ {\rm note}\ 18$.

¹⁰² MINISTRY OF CHEMICALS & FERTILIZERS, DEPARTMENT OF CHEMICALS AND PETROCHEMICALS, GOVERNMENT OF INDIA, DRAFT NATIONAL CHEMICAL POLICY (FINAL DRAFT NCP) (2014), https://chemexcil.in/uploads/files/DRAFT_ NATIONAL_CHEMICAL_POLICY_2014.pdf.

¹⁰³ Policy Resolution for Promotion of Petroleum, Chemicals and Petrochemical Investment Regions (PCPIRs), https://chemicals.nic.in/sites/default/files/PCPIRPolicy.pdf. (last visited Dec. 26, 2020).

¹⁰⁴ PLANNING COMMISSION OF INDIA, *supra* note 18, at 26 ("Consumption standards are policies implemented by the government to promote the safe use of products").

¹⁰⁵ Id.

¹⁰⁶ *Id.* (E.g., In US the limit for VOCs in paint is set at 250 g/litre and for lead the limit is set at a maximum of 90 ppm).

¹⁰⁷ Id.

access to the latest technologies which in turn will ensure the global competitiveness of the Indian chemical industry without compromising consumer standards.¹⁰⁸

CONCLUSION

The paint and dye industry is a vital intermediary industry of the chemical sector. With the expansion of the chemical sector and the development of the Indian economy, there is a need for more stringent regulation of chemical products and strengthened consumption standards.¹⁰⁹ The existing legislations, rules and regulations have to be strictly implemented, especially in the unorganised sector. It has become highly important that the regulators act and take stringent actions on the large-scale violation of the Rules of 2016 by the unorganised sector. The availability of the leadsafe paints in the market should be ensured considering the adverse impact of toxic lead paints (which are easily available in the market till date) on the environment and human health. On the other hand, there is no specific legislation in India to deal with the paint and dye industry as compared to several other Asian and African countries. The time is now ripe for the government of India to impose certain mandatory standards to prevent unorganized sectors from using lead in their paints. Conduction of awareness programs as suggested by the GAELP model law is of key importance and such programs should be initiated for both the common people as well as the paint manufacturers in order to spread awareness about the risk of lead poisoning to avoid the usage of lead-containing paints which are harmful to everyone.¹¹⁰

Organic chemicals play a critical role in the paint and dye industry.¹¹¹ However, the use of VOCs (volatile organic compounds) needs to be limited in the paint sector. The Planning Commission in the XII Five-Year Plan had recommended the mandatory use of "water-based paints", with only 5-15% petrochemical content, to ensure the health and safety of consumers. The Planning Commission had also recommended that consumption of higher-cost water-based paints should be encouraged.¹¹² The Indian chemical sector is very versatile and key to India's economic growth and industrial progress. But, if not regulated effectively, the amount of toxic chemicals used in this industry can lead to enormous health and environmental crisis in the country. India

¹¹² Id. at 96.



¹⁰⁸ *Id.* at 31.

¹⁰⁹ Planning Commission of India, supra note 18.

¹¹⁰ Mohanty, *supra* note 14.

¹¹¹ PLANNING COMMISSION OF INDIA, supra note 18, at 16.

has come a long way in making its legal regime compliant with its obligations under the international convention, but still, it has a long way to go. A comprehensive national level chemical management policy is the need of the hour that can act as a guidance document for all future legislative action and management strategies.

CHAPTER 12

LAWS REGULATING THE PHARMACEUTICAL SECTOR IN INDIA

INTRODUCTION

The Indian pharmaceutical industry meets more than 50% of the global demand for a number of vaccines, 40% of US prescription demand and 25% of all UK medicines. India provides the second-largest chunk of the world's pharmaceutical and biotech workforce. Indian products are sold to more than 200 countries across the world. Generic drugs account for 20% of global exports in terms of volume, making the nation the world's largest producer of generic medicines.¹ Pharmaceutical exports from India, including bulk medicines, intermediates, drug ingredients, biologics, AYUSH medicinal products and surgical devices amounted to US\$ 13.69 billion in FY20 (until January 2020).² As a result, the Indian healthcare and pharmaceutical industry is one of the fastest growing in the world and is projected to rise by a total of 754% between 2017 and 2060.³

Along with some important Mergers & Acquisitions (M&A) transactions, this remarkable record has also contributed to several big foreign investments in the pharmaceutical sector. The government has also been keen to support the pharmaceutical sector through the implementation of various policies. One of them is the Department of Pharmaceuticals' 'Pharma Vision 2020' program, aimed at making India a major hub for end-to-end drug discovery. From April 2000 to December 2019, the sector received aggregate Foreign Direct Investment (FDI), worth US\$ 16.39 billion. In November 2019, the Cabinet approved the extension/renewal of the current Pharmaceuticals Purchase Policy (PPP) on the same terms and conditions, adding an additional drug, called Alcoholic Hand Disinfectant (AHD) to the existing list of 103 drugs until the final closure/strategic disinvestment of pharmaceutical CPSUs.⁴

⁴ Global Pharma Looks to India: Prospects for Growth, supra note 2.



¹ *Indian Pharmaceuticals Industry Report May 2020,* INDIA BRAND EQUITY FOUNDATION (Dec. 04, 2020), https://www.ibef.org/industry/indian-pharmaceuticals-industry-analysis-presentation.

² *Global Pharma Looks to India: Prospects for Growth*, PRICE WATERHOUSE COOPERHOUSE(Dec. 04, 2020), https://www.pwc.com/gx/en/pharma-life-sciences/pdf/global-pharma-looks-to-india-final.pdf.

³ Indian Pharmaceuticals Industry Report May 2020, supra note 1.

PHARMACEUTICAL PRODUCTION REGIONS IN INDIA

The concentration of pharmaceutical small and medium scale units is spread over the following regions⁵:

S. No.	Region	Production value per annum (Rs. in crores)	Estimated employment
1	Maharashtra (Mumbai-Pune and Aurangabad)	12000-15000	65000
2	Gujarat (Ahmedabad- Vadodara)	10000-12000	55000
3	Delhi-UP and Haryana	5000	25000
4	Madhya Pradesh (Indore)	2500	15000
5	Uttarakhand (Dehradun)	2000	20000
6	Andhra Pradesh (Hyderabad- Medak)	8186	20000
7	Cuttack-(Bhubaneswar)		1400
	Total	39686 - 44686	201400

TABLE - 1



Figure 1: Production value per annum and the major pharmaceutical producing regions ⁶

MAJOR DRUGS AND PHARMACEUTICAL PRODUCTS MANUFACTURED IN THE COUNTRY

India's pharmaceutical industry is heavily dependent on chemicals and produces a wide array of drugs and pharmaceutical products. Some of the products produced in India by the pharmaceutical sector are listed below:

⁵ Amar Singh, *Status paper on Pharmaceutical clusters in India*, CLUSTER OBSERVATORY, http://clusterobservatory.in/report/Statxus-paper-on-Pharmaceuticals.pdf (last visited Dec. 04, 2020).

⁶ Amar Singh, *Status paper on Pharmaceutical clusters in India*, CLUSTER OBSERVATORY, http://clusterobservatory.in/report/Status-paper-on-Pharmaceuticals.pdf (last visited Dec. 04, 2020).

- **Drugs** including all the medical drugs approved for the internal or external use of humans or animals and all substances used for the diagnosis, cure, mitigation or elimination of any disease or illness in humans or animals.⁷
- **Bulk drugs** including any chemical, pharmaceutical, natural, biological or plant substance including its salts, esters, stereo-isomers and derivatives that conforms to pharmacopeial requirements.⁸
- **Formulations or medications** that are manufactured or produced without the use of one or more bulk drugs with pharmaceutical aids for internal or external use in the treatment, diagnosis, mitigation or prevention of disease in human beings.⁹
- **Manufactured drug** including all medicinal cannabis, coca derivatives, opium derivatives and poppy straw concentrate, or any other drug declared as manufactured drug by the Central Government.¹⁰
- Psychotropic substances that include any substance, natural or synthetic, or any natural material or any salt or preparation of such substance or material included in the list of psychotropic substances under the Schedule of the Narcotic Drugs and Psychotropic Substances Act, 1985.¹¹
- **Synthetic drugs** which are laboratory-produced chemical compounds. They can be made commercially for legitimate medicinal uses by drug producers and are either diverted from legal outlets or secretly developed in clandestine labs for illicit markets around the world.¹²
- **Generic drug**, a medication created to be the same as an existing approved brand-name drug in dosage form, safety, strength, route of administration, quality, and performance characteristics.¹³

⁷ The Drugs and Cosmetics Act, 1940 § 2(c).

⁸ Drugs Price Control Order, 1995 § 2(a).

⁹ *Id.* § 2(h).

¹⁰ The Narcotic Drugs and Psychotropic Substances Act, 1985 § 2(xi).

¹¹ Id. § 2(xiii).

¹² Synthetic Drugs, CADCA, https://www.cadca.org/synthetic-drugs (last visited Dec. 04, 2020).

¹³ *Generic Drug Facts*, US Food and Drug Administration, https://www.fda.gov/drugs/generic-drugs/ generic-drug-facts (last visited Dec. 03, 2020).

PRODUCTION OR MANUFACTURE OF DRUGS

This section enlists all the relevant Acts, Rules and Orders that govern the manufacture and production of pharmaceutical drugs in India for human or animal consumption. It highlights the relevant provisions in each of the legal instruments that drug manufacturers must abide by in relation to their management of chemicals.

Drugs and Cosmetics Act, 1940

The Drugs and Cosmetics Act, 1940 was enacted to regulate the import, manufacture, distribution and sale of drugs and cosmetics.¹⁴ Chapters II and III of the Act provide for the standards of quality to be maintained by drug manufacturers. Section 16 states that drugs need to meet the standard laid down in Schedule II. Section 18 prohibits the manufacture of certain drugs which are spurious, misbranded or adulterated as these are harmful to the consumer, and fail to meet the standards under Schedule II.¹⁵ The Central Government's power to regulate the manufacture of drugs in the public interest is provided under Section 26-A of the said Act and Section 26-B provides that the Central Government has the power to regulate production in cases of emergency.

In the exercise of its power under Section 26A of the Act, the Ministry of Health and Family Welfare has banned the manufacture, distribution and sale of the Colistin drug and its formulations for food producing animals, aqua farming, poultry and feed supplements, as it is likely to entail harm to human beings. The overuse of Colistin results in damage to the kidneys due to nephrotoxicity.¹⁶

Drugs and Cosmetics Rules, 1940

These Rules extensively cover every detail with respect to the manufacture and import/export of drugs and cosmetics in India. Part XII of the Rules provides for the standards of drugs, medical devices, patent and proprietary drugs to be maintained as per as per Indian Pharmacopeia. Schedule M provides for Good Manufacturing



¹⁴ State of Bihar v. Shree Baidyanath Ayurved Bhawan (P) Ltd., (2005) 2 SCC 762.

¹⁵ As per the Drugs and Cosmetics Act, 1940 A drug shall be deemed to be misbranded if it is so colored, coated, powdered or polished that damage is concealed or if it is made to appear of better or greater therapeutic value than it really is; or if it is not labelled in the prescribed manner; or if its label or container or anything accompanying the drug bears any statement, design or device which makes any false claim for the drug or which is false or misleading in any particular. A drug shall be deemed to be adulterated, if it consists, in whole or in part, of any filthy, putrid or decomposed substance. A drug shall be deemed to be spurious, if it is imported under a name which belongs to another drug; or if it is an imitation of, or is a substitute for, another drug or resembles another drug in a manner likely to deceive.

¹⁶ Ministry of Health and Family Welfare, S.O. 2607(E) (Notified on July 19, 2019).

Practices and states requirements for the premises, plants and equipment of pharmaceutical products. This is the most important set of Rules that every person involved in the manufacturing of pharmaceuticals must comply with. Schedule Y lays down the requirements for the application to manufacture new drugs. These include disclosing the level of animal or human toxicity, chemical and other pharmaceutical information and pharmacokinetic data.

Regulatory Authority

The production or manufacturing aspect of drugs and cosmetics is primarily regulated under the Ministry of Health and Family Welfare by the Central Drugs Standard and Control Organisation (CDSCO). The CDSCO prescribes guidelines and standards to ensure the safety, effectiveness and quality of drugs, cosmetics, diagnostics and devices in the country; controls the market authorization of new drugs and the requirements of clinical trials; supervises drug imports and grants licenses to produce the abovementioned products. The Drugs and Cosmetics Act, allied Rules and amendments are regulated by the CDSCO. Under the Act, the Drugs Technical Advisory Board (DTAB) is constituted which is responsible for making various amendments to the Act and by-laws to the Act. It works in tandem with the Drugs Consultative Committee (DCC) which advises the DTAB with regard to the uniform administration of the Act. The DTAB has made the Good Laboratory Practices (GLP) mentioned under the Schedule of the Drugs and Cosmetics Rules, 1940 mandatory for the manufacturers and importers of drugs.

Narcotic Drugs and Psychotropic Substances Act, 1985

Under the Act, 'narcotic drug' means cannabis (hemp), coca leaf, poppy straw and encompasses all the manufactured products and psychotropic substances (synthetic or natural), or any natural material or any salt or preparation of such product or material contained in the list of psychotropic substances under the Schedule of the Act. Manufacture, sale, possession, purchase, use, transport, import or export of narcotic or psychotropic material is permitted only for medicinal or scientific purposes as per Section 8. Chapter 4 of the Act provides for the penalties which may be imposed under the Act for the import, export, collection, sale and manufacture of prohibited drugs. The Schedule under the Act contains a list of psychotropic drugs which are prohibited.

Narcotic Drugs and Psychotropic Substances Rules, 1985

These Rules deal closely with the manufacture, sale, manufacture, import and export of opium in India. Rule 31 states that opium shall not be produced except by the opium factories of the Central Government at Neemuch and Ghazipur. The rules for the manufacture of psychotropic substances are contained in Chapter VII. The Narcotic Drugs and Psychotropic Substances (Second Amendment) Rules, 2015 specify that no person shall produce any of the psychotropic substances except in accordance with the conditions of a license issued under the Drugs and Cosmetics Rules, 1945 by an authority in-charge of Drugs Control in a State, appointed on this behalf by the Government of the State.

Narcotic Drugs and Psychotropic Substances (Regulation of Controlled Substances) Order, 2013

Clause 4 of the Order states that no individual shall, without a unique registration number in Form-A issued by the Zonal Director, produce, possess, sell, purchase, distribute, consume, store, offer for sale or distribution or mediate in the sale / purchase of any controlled substance contained in Schedule-A through the internet, social media or in any other manner. It requires every application to be made in order of Form-B and every person who has been registered shall file quarterly return in Form-E, Form-F, or Form-L, as the case may be, to the concerned Zonal Director of the Narcotics Control Bureau.

Narcotic Drugs and Psychotropic Substances (Regulation of Controlled Substances) Amendment Order, 2019

This Order deals with the regulation of controlled substances. Schedule A to the Order provides an exhaustive list of the same, including - N-Acetyl Anthranilic acid, Anthranilic acid, Acetic anhydride, Pseudoephedrine and its salts, and Ephedrine and its salts. Order 1 states that no person shall manufacture, purchase, sell, distribute, store, possess, consume, offer for sale or distribution, or mediate in the sale/ purchase of any controlled substance contained in Schedule-A through the use of internet, social media or in any other manner, without a unique registration number in Form-A, issued by the Zonal Director of the Narcotics Control Bureau. It requires that persons allowed to manufacture these drugs are required to comply with Form E, F and L and submit the particulars to the Zonal Director.



Regulatory Authority

The Narcotic Drugs and Psychotropic Substances Act, allied Amending Acts, Rules and Regulations are regulated by the Department of Revenue under the Ministry of Finance. The major responsibility of the Department of Revenue here is to check the manufacturing of such drugs and substances and seize illegal manufacture/import/ export of the same and impose penalty for such offences. Both the Act and the Rules provide for the appointment of the Narcotics Commissioner and authorize him to perform such functions as may be necessary under the Act/Rules and as may be prescribed by the Central Government.

IMPORT AND EXPORT OF DRUGS AND PHARMACEUTICALS

India primarily exports to the UK, USA, Russia and South Africa. The pharmaceutical imports in 2018-19 amounted to Rs. 35,000 crores with bulk drugs and intermediates comprising 63% of the overall pharmaceutical imports, followed by Drug Formulations and Biologicals (36%).¹⁷ India imports largely from China, USA, Italy and Germany. The country has had surpluses in pharmaceutical trade as shown in the table below.

India's Exports Category-wise (in USD million)18				
Categories	FY 2016-17	FY 2017-18	FY 2018-19	Change%
Drug formulations & Biologicals	11,987.16	12094.48	13561.53	12.13
Bulk Drugs & Drug intermediates	3,383.52	3525.65	3895.14	10.48
Vaccines	679.28	653.40	661.93	1.31
Surgicals	333.36	552.16	569.77	3.19
Herbal Products	278.02	311.74	298.90	-4.12
AYUSH	123.67	144.38	147.22	1.96
Grand Total	16,785	17281	19134	10.72

EXPORT OF PHARMA PRODUCTS: INDIAN PERSPECTIVE

Table - 2

¹⁷ Annual Report: 2019-20, DEPARTMENT OF PHARMACEUTICALS, MINISTRY OF CHEMICALS AND FERTILIZERS https://pharmaceuticals.gov.in/sites/default/files/Annual%20Report%202019-20.pdf (last visited Dec. 03, 2020).

¹⁸ *Export Products (Pharmaceuticals)*, DEPARTMENT OF COMMERCE, MINISTRY OF COMMERCE AND INDUSTRY, https://commerce.gov.in/InnerContent.aspx?Id=506 (last visited Dec. 03, 2020).

INDIA'S PHARMA EXPORTS REGION-WISE (IN USD MILLION) ¹⁹				
Region	FY 2016-17	FY 2017-18	FY 2018-19	Change%
North America	5.770.13	5348.00	6145.67	14.92
Africa	3,213.76	3346.97	3436.44	2.67
EU	2,522.74	2752.64	3003.91	9.13
ASEAN	1,083.09	1181.45	1310.14	10.89
LAC	992.82	1135.15	1308.30	15.25
Middle East	807.56	869.05	1074.11	23.60
South Asia	721.99	764.33	812.84	6.35
CIS	631.90	733.17	788.27	7.52
Asia (Excluding Middle East)	565.31	627.30	693.62	10.57
Oceania	297.28	320.25	340.84	6.43
Other European Countries	129.78	150.99	162.86	7.86
Other America	47.65	52.48	57.38	9.33
Grand Total	16,785.00	17281.81	19134.39	10.72

TABLE - 3

As per the Rule 43-A of the Drugs and Cosmetics Rules, 1945, drugs can be imported into India only from the following ports -

- Amritsar Railway Stations and Firozepur Cantonment: in respect of drugs imported by rail across the frontier with Pakistan.
- Bongaon, Ranaghat and Mohiassan Railway Stations: in respect of drugs imported by rail across the frontier with Bangladesh.
- Sutarkandi in Assam, Petrapole Road in West Bengal, Agartala in Tripura and Old Raghna Bazar: in respect of drugs imported by Road from Bangladesh.
- Raxual: In respect of drugs imported by road and railway lines connecting Birganj in Nepal and Raxual in India.

19 *Id*.



- Kolkata, Chennai, Mumbai, Nhava Sheva, Cochin, Kandla, Inland Container Depots at Tuglakabad and Patparganjin Delhi, Marmugao portin Goa, Tuticorin and Kamrajar Portin Tamil Nadu, Visakhapatnam and Krishnapatnam port in Andhra Pradesh and Hazira port and Inland Container Depot Khohdiyar, Gandhinagar and Mundra Port in Gujarat and Inland Container Depot Dhannad, Indore in Madhya Pradesh: in respect of drugs imported by sea into India;
- Delhi, Mumbai, Kolkata, Chennai, Goa, Hyderabad, Ahmedabad, Vishakhapatnam and Bengaluru: in respect of drugs imported by air into India.

Regulating the import and export of drugs into and outside the county is a very important task and requires the adherence of strict rules and regulations. The following Acts, Rules, Regulations and Order govern this process with respect to the pharmaceutical sector and their handling of drugs and chemicals.

Drugs and Cosmetics Act, 1940

Chapter III of the Act provides for controls on drug imports. Section 10 imposes a ban on the importation of spurious, misbranded and adulterated drugs and Section 10A provides for the Central Government's power to restrict the importation of drugs that are harmful to humans and animals. Schedule II of the Act specifies that the imported drugs and the drugs distributed, stored and produced or displayed for sale shall meet with the standards contained therein. These include the standards maintained at the Central Veterinary Laboratory, Weybridge, Surrey, UK and the International Laboratory for Biological Tests, Stantans Serminstitut, Copenhagen, and other laboratories recognized from time to time by the World Health Organisation, and such further standards of quality, strength and purity that may be prescribed.

The Drugs and Cosmetics (Amendment) Act, 1982 provided a new definition of misbranded drugs, and included the improper labelling of the container storing the drug within misbranding. Section 9A amended the definition of adulterated drugs and included unsanitary storage conditions that led to drugs becoming adulterated. Furthermore, Section 10A of the Drugs and Cosmetics (Amendment) Act, 1982 empowers the Central Government to restrict the importation of harmful drugs, if the Central Government is satisfied that the use of such drugs or cosmetics is likely to pose any risk to humans or animals or that such drug does not have the medicinal

values claimed for it, or contains such quantity of ingredients for which there is no therapeutic justification.

Drugs and Cosmetics Rules, 1945

Rule 30 forbids the importation of drugs after their potency has expired. Further, Rule 30B forbids the importation of certain drugs if such drugs are banned in the country of origin and Rule 31 establishes the norm on some other manufactured drugs, based on the drug's shelf life and toxicity. The criteria for applying to import/export drugs to India are set out in Schedule Y. These include– the level of toxicity for humans/ animals, the labeling requirements to be met and the drug pharmacokinetic data.

The import and export of drugs is mainly regulated by the CDSCO under the Department of Health and Welfare, and the Directorate General of Foreign Trade under the Ministry of Commerce and Industry as discussed earlier. While the CDSCO is in charge of granting export and import licenses to manufacturers, sellers, distributors, etc., and checking the standard or the quality of the drugs being imported or exported, the Directorate General of Foreign Trade is in charge of regulating the type of drugs that can be imported or exported. A recent example would be the Central Government's decision to restrict the export of Hydrochloroquine which was executed by the Directorate.²⁰ The importation of drugs is permitted only after a license has been obtained from the licensing authority in the form of an application under Form-10 of the Drugs and Cosmetics Act. Before issuing the license, the licensing authority shall examine the application and the details submitted under the form. The Drugs Controller General, CDSCO appointed under the Act, has the authority to provide the registration certificate to allow import of manufactured drugs from foreign countries.

Narcotic Drugs and Psychotropic Substances Rules, 1985

These Rules extensively deal with opium exports and imports in India. Rule 32 states that exports of opium are prohibited except when the exports are made on behalf of the Central Government. Chapters VA and VI are also relevant to the import of drugs in India. Chapter VA deals with the possession, distribution, inter-state export, inter-state import, consumption, purchase, sale and the usage of necessary drugs. Section 54 prohibits the importation of opium, codeine, concentrate of poppy straw

²⁰ *ICMR issues revised advisory on use of hydroxychloroquine*, ECONOMIC TIMES HEALTH WORLD (May. 23, 2020), https://health.economictimes.indiatimes.com/news/policy/icmr-issues-revised-advisory-on-use-of-hydroxychloroquine/75911818.



and morphine, thebaine and their salts, except by the Opium Factories regulated by the Government. Chapter VI also contains provisions concerning the application and issuance of import certificates, the transshipment procedure, the transit, application and issuance of export authorizations, the diversion of consignments, and the prohibition of importing and exporting consignments via a post office box, etc.

Narcotic Drugs and Psychotropic Substances (Regulation of Controlled Substances) Order, 2013

Clauses 10 and 11 of the Order specify that no individual shall import or export any of the regulated substances in Schedule B (list of controlled substances whose export from India is subject to controls, 19 drugs included) except in compliance with the conditions of the Narcotics Commissioner's No Objection Certificate.

According to Section 2 of the Prevention of Illicit Traffic in Narcotic Drugs and Psychotropic Substances (Amendment) Act, 1988, any person engaged in the manufacture, production, purchase, sale, possession, transport, concealment, warehousing, usage or consumption of narcotic drugs, inter-State export/ import, export/ import into India or trans-shipment of narcotic drugs or psychotropic substances, save when permitted under the Narcotic Drugs and Psychotropic Substances Act, is said to be involved in illegal trafficking. According to Section 27A of the Act, whoever engages in financing, directly or indirectly, any of the activities specified in Section 2 of the Act or harbours any person engaged in any of the above-mentioned activities, shall be punished with rigorous imprisonment for a term not less than ten years but which may extend to twenty years and may also be liable to pay fines ranging from one lakh rupees to two lakh rupees.

The Amendment also prescribes the insertion of Section 31A which prescribes death penalty for certain offences in case of subsequent conviction. If any individual is subsequently convicted for the commission or attempt to commit criminal conspiracy, or abetment to commit any offence relating to the involvement in manufacture, production, transportation, possession, export from India, import into India or transshipment of narcotic drugs or psychotropic substances of quantity equal to or more than that listed in the table below, then the direct or indirect financing of any of the activities mentioned above shall be punishable with death.

Particulars of narcotic drugs/ psychotropic substances	Quantity
(i) Opium	10 kg
(ii) Morphine	1 kg
(iii) Heroin	1 kg
(iv) Codeine	1 kg
(v) Thebaine	1 kg
(vi) Cocaine	500 grams
(vii) Hashish	20 kg
(viii) Any mixture with or without any neutral material of any of the above drugs	1500 grams
(ix) LSD, LSD-25	500 grams
(x) THC (Tetrahydrocannabinols), the following isomers: 6a(10a), 6a(7), 7,8,9,10,9 and their stereochemical variants	500 grams
(xi) Methamphetamine	1500 grams
(xii) Methaqualone	1500 grams
(xiii) Amphetamine	1500 grams
(xiv) Salts and preparations of the psychotropic substances mentioned in (ix) to (xiii)	1500 grams

TABLE - 4: Particulars of narcotic drugs/ psychotropic substances

Calcium Carbide Rules, 1987

These Rules are extremely relevant as carbide is used to manufacture acetylene which is an active ingredient in the manufacture of modern drugs and medicines. Part I prohibits import of carbide without license while Part II lists the ports in India where carbide products can be imported from, viz., Cochin, Calcutta, Bombay, Mangalore, Tuticorin, Kandla, Port Blair, Madras, and Visakhapatnam. It also lists down the duties of master or the agent in port, facilities to be afforded to Inspecting Officers, etc.

Part III provides that except with the previous Central Government's sanction in each case and the below mentioned conditions, no person shall import carbide by land. The conditions are;

- i. that the carbide is transported in prescribed receptacles;
- ii. that all appropriate steps are taken to avoid carbide coming into contact with water or metals like silver and copper during importation;



iii. that after the landing of carbide, it is immediately removed to a licensed storage facility.

In addition, Part IV deals with the importation by air and provides that similar conditions as stipulated for the import of carbide by land shall apply for import of carbide by air. These Rules are regulated by the Department for Promotion of Industry and Internal Trade (DPIIT) under the Ministry of Commerce and Industry. This department ensures the alignment of industrial development in the country with the goals of the nation. It regulates certain industries, especially those that deal with hazardous substances. According to the Rules, a District Authority shall be formed consisting of the Commissioner or Deputy Commissioner of Police of that specific region or the District Magistrate. Such authority has the power to grant license for the import of carbide substances into the country either by land, air or water.

Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989

Hydrochloric acid is used by the pharmaceutical industry for pH control, as a catalyst in synthesis, as a reduction agent and for water deionization. It is used in the production process of many organic chemicals.²¹ The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 are relevant to the pharmaceutical sector as Hydrochloric Acid (HCl) is an active ingredient for the manufacture of drugs and it is mentioned under Schedule I of these rules as constituting a hazardous chemical. Rule 18 of these Rules specifies that any person liable for the importation of hazardous chemicals in India shall, within 30 days, send the following details to the authority concerned: (i) the name and address of the person who has received the consignment in India; (ii) the port of entry in India; (iii) the mode of transport from the exporting country to India; (iv) the quantity of chemical (s) being imported; and (v) complete product safety information.

Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016

These Rules are relevant to the pharmaceutical sector as the formulation/production of pharmaceuticals/drugs and health care products and the residues generated from the same falls under hazardous wastes as set out in Schedule I. Some of the hazardous chemicals listed under Schedule I are asbestos or asbestos-containing

²¹ *Hydrochloric Acid*, ERCO WORLDWIDE, http://www.ercoworldwide.com/index.php/products/ hydrochloric-acid/ (last visited Dec. 03, 2020).

materials, chlorine, caustic soda, phenol, mineral acids and other pharmaceutical and healthcare products.

Chapter III of the Act contains provisions relating to the control of import and export of hazardous wastes. Actual users intending to import or transit for transboundary movement of hazardous and other wastes specified in Part A²² and Part B²³ of Schedule III shall apply in Form 5, i.e., the application for import or export of hazardous and other wastes for their reuse, recycling, recovery, co-processing or utilization, along with the documents listed therein, to the Ministry of Environment, Forest and Climate Change for the proposed import together with the prior informed consent of the exporting country in respect of Part A of Schedule III waste.

PACKAGING AND LABELLING OF DRUGS AND PHARMACEUTICALS

Drugs and pharmaceuticals must be labeled and packaged in an appropriate manner so that the consumer is made aware of the contents of the drug, the dosage, and date of manufacture, expiry and other precautions to be undertaken for consuming these drugs. The legal instruments mentioned below govern the same.

Drugs and Cosmetics Rules, 1945

Rule 96 provides for the manner of labelling depending on the concentration of chemicals. Rule 97 governs the labelling of medicines depending upon their dosage. Rule 105-A sets out drug packaging rules in accordance with Schedule X. Rule 97 stipulates that the container of a medicinal product for internal use shall, if it contains a substance listed under the following schedules, be labelled with the corresponding warnings in the table below.²⁴

DRUG LISTED UNDER	SYMBOL/WARNING	
Schedule G	'Caution: it is dangerous to take this preparation except under medical supervision'	

TABLE - 5

²² List of hazardous wastes applicable for import and export with Prior Informed Consent.

²³ List of other wastes applicable for import and export and not requiring Prior Informed Consent.

²⁴ Schedule – G - Most of these drugs are hormonal preparations; Schedule – H -lists down prescription drugs; Schedule – X – lists down stereoisomeric drugs and states that the salts of stereoisomeric substances and preparations containing such substances are also covered under this schedule.

Schedule H	Rx Ambroxol Hydrochloride, Levosalbuta (BRAND NA Each 5ml contains: Ambroxol Hydrochloride I.P. 30mg Levosalbutamol Sulphate I.P Equivalent to Levosalbutamol 1mg Guaiphenesin I.P 50mg Flavoured Syrup Base Dosage: As prescribed by the Physician. Keep out of reach of children	Amol and Guaiphenesin Syrup ME) SCHEDULE H PRESCRIPTION DRUG-CAUTION Not to be sold by retail without the prescription of a Registered Medical Practitioner.
Schedule H and comes within the purview of the Narcotic Drugs and Psychotropic Substances Act, 1985	NRx Escitalopram Oxalate and Clonazepam Tablets Each film coated tablet contains: Escitalopram Oxalate IP Equivalent to Escitalopram 10mg Clonazepam IP 0.5mg Colour: Red Oxide of Iron Dosage: As prescribed by the Physician. Keep out of reach of children	SCHEDULE H PRESCRIPTION DRUG-WARNING To be sold by retail on the prescription of a Registered Medical Practitioner only.
Schedule X	XRx Methylphenidate Hydrochloride Prolonged-Release Tablets IP 10mg SCHEDULE X PRESCRIPTION DRUG-WARNING To be sold by retail on the prescription of a Registered Medical Practitioner only.	

Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

Chapter V deals with the packaging and labelling rules. It requires that the storage, treatment and disposal facility operator and each person handling hazardous or other waste shall ensure that said waste is packaged in a manner appropriate for secure handling, storage and transportation according to the guidelines issued from time to time by the Central Pollution Control Board. According to the Central Pollution Control Board's Final Document on Revised Classification of Industrial Sectors under the Red, Orange, Green, and White categories. The pharmaceutical sector is listed under the Red category of industrial sectors. It reports that the pharmaceutical sector is amongst the '17 categories of Highly Polluting Industries' and is responsible for all kinds of pollution.²⁵

²⁵ Final document on revised classification of industrial sectors under Red, Orange, Green and White categories, INDIA ENVIRONMENT PORTAL (Feb. 29, 2020), http://www.indiaenvironmentportal.org.in/

TRANSPORT AND STORAGE

There are several ministries and departments controlling and regulating the manner in which drugs and cosmetics are transported and stored, but it is primarily administered by the Department of Health established under the Ministry of Health and Welfare, and the Department of Revenue established under the Ministry of Finance, and the Ministry of Environment and Forests.

Narcotic Drugs and Psychotropic Substances Act with allied Rules and Orders

Chapter VA of the Narcotic Drugs and Psychotropic Substances Rules, 1985 provides for the manner in which these drugs are to be transported and the relevant documents that the manufacturer or consigner must have in order to transport such drugs. Chapter VI provides for transshipment rules for drugs. Rule 67 provides the documentation needed for the transportation of psychotropic substances and specifically notes that no consignment of psychotropic substances shall be transported, exported inter-State or imported inter-State unless supplemented by a consignment note in Form 6 annexed to the Narcotic Drugs and Psychotropic Substances Rules, 1985 and in the manner specified therein. The Form contains details of the consignment note, date when the drug was received, quantity of the drug and concentration of various chemicals. The Narcotic Drugs and Psychotropic Substances (Second Amendment) Rules, 2015 has further amended the 1985 Rules and provides that a psychotropic substance specified in Schedule I shall be transported out of India for export only after the issuance of export authorization by the Narcotics Commissioner under Rule 59.

Clause 7 of the Narcotic Drugs and Psychotropic Substances (Regulation of Controlled Substances) Order, 2013 specifies that no consignment of controlled substances in Schedule-A shall be transported inside India from one location to another, except when supplemented by a Form-G consignment note. Clause 7(8)(a) of the Order provides that whenever a controlled substance under Schedule I of the Act shall be transported by motorized tankers or by packages, all the inlets and outlets of these tankers or packages, as the case may be, shall be sealed with tamper-proof seals, each of which shall have a recognizable outline and shall be affixed at the consignor's premises and extracted at the consignee's premises.

content/425850/final-document-on-revised-classification-of-industrial-sectors-under-red-orange-green-and-white-categories/.



Calcium Carbide Rules, 1987

Rule 19 states that carbide transported in a quantity not exceeding 5 kilograms must be packaged in prescribed receptacles and should not contain more than 1 kilogram of carbide in each receptacle. The Rules cover regulations for transport by railways, road, air and waterways. Chapter 5 is dedicated to provide regulations for storage. Rule 25 specifies that no carbide shall be stored in any location with or without a license unless it is 'commercially pure' – i.e., unless it is free from impurities that will cause the gas to evolve either alone or in a mixture with air, liable to ignite spontaneously and unless the gas produced complies with the conditions laid down in the calcium carbide specification.

Central Motor Vehicle Transport Rules, 1989

These Rules are relevant to the pharmaceutical sector as they propose certain conditions that are to be met for the transportation of hazardous or dangerous goods. Table III of the Central Motor Vehicle Transport Rules, 1989 provides an exhaustive list of such hazardous and dangerous goods in which acetic anhydride is listed as a corrosive chemical and piperidone and acetone are listed as hazardous flammable chemicals. Piperidine is used as a solvent and base in pharmaceutical industries²⁶ while acetone is an organic solvent which is used in the production of pills and liquid medicines to have proper density and is also used as an antiseptic.²⁷ These are some of the chemicals used to manufacture drugs and hence these Rules are relevant to the pharmaceutical sector. The Rules require the driver driving the vehicle containing such substances to have the requisite educational qualifications, and that the vehicle must display the appropriate logo demonstrating that the material contained therein is flammable, corrosive, etc., as specified in the Rules.

The Motor Vehicles (Amendment) Act, 2019

The 2019 amendment to the Motor Vehicles Act, 1988 also made some changes to Section 14 of the Act. The 2019 Amendment to the Act has increased the renewal period for carrying hazardous goods to three years instead of one year provided the driver undergoes a refresher training programme as specified by the Central Government. The 2019 Amendment has also added that all the Motor Vehicles carrying or meant

²⁶ *Piperidine*, JUBILANT LIFE SCIENCES, https://www.jubl.com/lsi/our-businesses/speciality-intermediates/ advance-intermediates/piperidine (last visited Dec. 04, 2020).

²⁷ Six Industrial Uses for Acetone, BellCHEM, https://www.bellchem.com/news/six-industrial-uses-foracetone (last visited Dec. 03, 2020).

to carry dangerous or hazardous goods must have an insurance policy against third party risks under the Public Liability Insurance Act, 1991.

Prohibition of Use of Polyethylene Terephthalate or Plastic Containers for Primary Packaging of Drug Formulations for Using in Certain Cases Rules, 2014

These Rules, regulated under the Ministry of Health and Welfare by the Central Drugs Standard Control Organisation, were implemented through a Notification G.S.R. 701(E) dated 29 September, 2014. The Rules state that no manufacturer shall use polyethylene terephthalate or plastic containers in liquid oral formulations for primary packaging of drug formulations for geriatric use, paediatric use, and use in cases of women of reproductive age group and pregnant women. They also stressed that any manufacturer who contravenes any of the provisions of the Rules is liable to penalty under the Drugs and Cosmetics Act, 1940.

According to Rule 18 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, the transportation of dangerous and other waste shall be in compliance with the provisions of these rules, the guidelines issued from time to time by the Central Pollution Control Board and the Rules enacted by the Central Government under the Motor Vehicles Act, 1988. Rule 16 sets down that the operator of the facility shall be responsible for storing wastes.

DISPOSAL AND WASTE MANAGEMENT

Careless disposal of pharmaceutical products and drugs or waste generated from pharmaceutical industries can have deleterious effects on human health and environment. Therefore, this part discusses the handling of hazardous substances, chemicals and wastes in the drugs and pharmaceutical sector. It also discusses the legislative and regulatory framework that provides for effective and efficient hazardous waste management strategy.

Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981

According to Section 24 of the Water (Prevention and Control of Pollution) Act, 1974, no individual shall knowingly trigger or authorize any noxious, poisonous or polluting matter determined in compliance with such standards as may be laid down by the
State Board for entry (directly or indirectly) into any stream, sewer, well or on land. Section 25 restricts the number of discharge outlets an industry can have. Section 22 of the Air Act prohibits industries from emitting air pollutants beyond the limit laid down by the State Pollution Control Board from time to time. Both the Water and the Air Act are regulated by the Ministry of Environment, Forest and Climate Change with the assistance of the Central Pollution Control Board and the State Pollution Control Boards. Under these Acts the Pollution Control Boards have the right to audit the factories and their emission of wastes into lakes and rivers, the power to restrict such emissions and the number of outlets from such factories discharging wastes into water bodies, the power to lay down emission standards for the factories and also inspect the factories and regulate emissions.

The Environment (Protection) Amendment Rules, 2019

On 23rd January, 2020, the Ministry of Environment, Forest and Climate Change released draft Environment (Protection) Amendment Rules, 2019. The amendments are made in Schedule – I, and the serial number 73 related to "Bulk Drug and Formulation (Pharmaceutical)" has been substituted under the Environment (Protection) Rules, 1986. According to these Rules, sludge containing antibiotic residues shall be incinerated and the standard of incinerator notified for common hazardous waste incinerators or industry specific incinerators shall be applicable to them.

Schedule I under serial number 73 which lays down the emission standards for the pharmaceutical industry for bulk drugs is now amended as follows:

EFFLUENT STANDARDS			
	For final outlet of ETP Limiting value for concentration (in mg/l		
i) Compulsory Parameters			
pH	6.0 -8.5		
Biological Oxygen Demand (BOD) (3 days 27°C)	30		
Chemical Oxygen Demand (COD)	250		
Total Suspended Solids (TSS)	100		
Total Dissolved Solids (TDS)	2100		
Oil & Grease	10		

TABLE - 6

Bio - Assay Test	90% Survival of Fish after first 96 hours in
ii) Additional Parameters	
Ammonical Nitrogen	50
Nitrate Nitrogen	10
Benzene	0.05
Toluene	0.05
Xylene	0.06
Methylene Chloride	0.9
Phosphates as P	5
Chlorides	1000
Sulphates as SO_4	1000
Fluoride	2
Sulphides as S	2
Phenolic Compounds	1
Total Residual Chlorine	1
Zinc	5
Iron	3
Copper	3
Total Chromium	2
Hexavalent Chromium (Cr ⁶⁺)	0.1
Cyanide	0.1
Arsenic	0.2
Mercury	0.01
Lead	0.1
Active Pharmaceutical	0.05
Ingredient (API)	

Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

Rule 16 states that the occupier of a captive facility or the operator of a common facility, shall from time to time plan and set up the storage, treatment, and disposal facility in compliance with the technical guidelines provided in this regard by the Central Pollution Control Board, and shall procure approval from the State Pollution Control Board for the plan and layout in this regard. Schedule I categorizes the production/ formulation of drugs, pharmaceutical and health care products within the list of processes that generate hazardous wastes. Part A of Schedule III prescribes that hazardous substances from the preparation, production and usage of pharmaceutical products, except those listed in Part B of Schedule III, can only be exported and imported with prior consent.

Plastic Waste Management Rules, 2016

The pharmaceutical industry is one of the biggest producers of single use plastic and also one of the largest generators of plastic waste in India. Rule 8 of the Plastic Waste Management Rules, 2016 stipulates that all the institutional generators of plastic waste shall segregate and store the waste generated by them in compliance with the Municipal Solid Waste (Management and Handling) Rules, 2000 and deliver the segregated waste to authorized waste treatment or disposal facilities or deposition centres either on their own or through authorized waste management facilities. Under these laws, which are also regulated by the Ministry of Environment, Forest and Climate Change, it is the duty of the State Level Monitoring Committee to ensure the proper disposal of waste by producers that overlook the waste management system implemented by local municipal authorities.

Plastic is one of the most common packaging materials in the pharmaceutical sector, compared to its substitutes- paper, glass and aluminum. The low cost of packaging drives its use in the pharmaceutical sector. Plastic bottles have always been the chosen method of packaging capsules and tablets. They are often used for the packaging of liquid dosages, such as nasal, syrup-based, and ophthalmic products. The advantage of a plastic container is that the pharmaceutical companies can more easily and cost-effectively put more pills in bottles. The demand for pharmaceutical plastic bottles was projected at USD 7.34 billion in 2018 and is anticipated to hit USD 9.31 billion by 2024, a CAGR of 4.11 percent during the 2019-2024.²⁸

Owing to these reasons, Rule 9 of the Plastic Management Rules, 2016 talks about Extended Producer Responsibility. The fundamental premise of Extended Producer Responsibility is to decrease the total environmental impact of post-consumer products through landfill diversion and internalization of the associated costs by producers. The Plastic Management Rules, 2016, granted a period between six months to a year, depending on whether it was a producer or brand owner — to develop a system to ensure the plastic waste generated, including sachets and pouches, is brought back to the recycling fold.²⁹

²⁹ Alev et al, *Extended Producer Responsibility for Pharmaceuticals* (Georgia Tech Scheller College of Business Research Paper No. 2015-19), https://ssrn.com/abstract=2693169.



^{28 \$9.31} Billion Pharmaceutical Plastic Bottles Markets 2018-2019 - Global Growth, Trends, and Forecast to 2024BUSINESS WIRE, https://www.businesswire.com/news/home/20190722005469/en/9.31-Billion-Pharmaceutical-Plastic-Bottles-Markets-2018-2019 (last visited Dec. 04, 2020).

Bio-Medical Waste Management Rules, 2016

These Rules extend to all individuals producing, processing, storing, transporting, receiving, treating, disposing or handling any type of bio-medical waste. Bio-medical waste means any waste generated during the diagnosis, treatment or immunization of humans or animals or research activities related to it or in the production or testing of biological or health camps, including the categories referred to in Schedule I to the Bio-Medical Waste Management Rules, 2016. Schedule I covers drugs manufactured by the pharmaceutical industry, and the handling of expired drugs in particular. As per Rule 4, the duty of the occupier is to ensure the disposal of such bio-medical wastes is done in a manner that does not harm the environment and the disposal premises are ventilated, safe and located in a secured area. These Rules specify the manner in which bio-medical waste is to be labelled, packed and transported, and also the manner in which such waste is to be treated.

The primary Ministry regulating waste disposal and management under the Bio-Medical Waste Management Rules, 2016 is the Ministry of Environment Forest and Climate Change. Additionally, the Ministry of Health and Family Welfare, the CPCB and the SPCBs have the authority to ensure compliance of the various Rules by the occupier or manufacturer of bio-medical wastes.

On 16th March 2018, the Central Government notified the Bio-Medical Waste Management (Amendment) Rules, 2018 which amended Rule 5(c) to provide that it is the responsibility of each operator of a common bio-medical waste treatment and disposal facility to set up a bar coding and global positioning system, in compliance with the guidelines issued by the Central Pollution Control Board, for the handling of bio-medical waste.

INTERNATIONAL INSTRUMENTS GOVERNING PHARMACEUTICALS IN INDIA

BASEL CONVENTION

The principal goal of the Basel Convention is to protect the environment and human health from the perils of hazardous wastes. Under it, a broad range of wastes are classified as "hazardous wastes", based on their origin, characteristics and composition. It also contains two distinct categories of waste under "other wastes", *viz.,* incinerator ash and household waste.³⁰ India is a signatory to the Convention since March 1990.

The Basel Convention impacts the pharmaceutical industry. Under the Convention, the definition of "hazardous wastes" is in accordance with the list of wastes listed under Annexure I. Under the serial number Y2 and Y3, the Annexure provides for the wastes from preparation and production of the pharmaceutical products and, the waste drugs, pharmaceuticals and medicines respectively. Moreover, Annexure VII of the Convention provides the list of wastes that contain either organic or inorganic substitutes and Serial No. A410 contains the wastes that are obtained from the preparation, production and use of pharmaceutical products.

Annex – I - Categories of Wastes to be Controlled Waste Streams

TABLE - 7

Y1	Clinical wastes from medical care in hospitals, medical centres and clinics
Y2	Wastes from the production and preparation of pharmaceutical products
Y3	Waste pharmaceuticals, drugs and medicines

Table: Annexure I to the Basel Convention listing pharmaceutical wastes under Y2 and Y3 as categories of wastes to be controlled.³¹

A4 WASTES WHICH MAY CONTAIN EITHER INORGANIC OR ORGANIC CONSTITUENTS

Table - 8

A4010	Wastes from the production, preparation and use of pharmaceutical products but excluding such wastes specified on list B.
A4020	Clinical and related wastes; that is waste arising from medical, nursing, dental, veterinary, or similar practices, and wastes generated in hospitals or other facilities during the investigation or treatment of patients, or research projects.

³⁰ *Overview: Basel Convention,* UNO, http://www.basel.int/TheConvention/Overview/tabid/1271/ Default.aspx (last visited Dec. 03, 2020).

³¹ Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal Annex I, Mar. 22, 1989, 1673 U.N.T.S. 57.

Table: Annexure VIII to the Basel Convention listing wastes from production of pharmaceuticals under A4010, as wastes which may contain organic or inorganic constituents.³²

REQUIREMENTS TO BE MET UNDER THE CONVENTION

Import and Export

Any party seeking to limit or ban the import of hazardous waste must notify the other parties regarding the same.³³ The other parties shall ban the export of hazardous wastes to the countries that have prohibited these imports.³⁴ Where a State has not categorically denied such imports, no country can export their wastes to such country without getting prior informed consent for the same from such countries.³⁵ There is also prohibition on the export of hazardous waste to the developing nations which have legislations in place that limit imports, and further that limit exports to such countries where there is a reason to believe that the importing nation does not have eco-friendly waste management systems.³⁶

Packaging and Labelling

The Convention mandates that hazardous and other wastes, that are mentioned under Annex 1 of the Convention, such as the wastes that are generated from the manufacture of pharmaceutical products referred to in Y2 and the pharmaceutical wastes referred to in Y3, are to be the subject of a transboundary movement and therefore they should be labelled, packaged and transported in accordance with the internationally recognized and generally accepted standards and rules in the field of labelling, packaging and transport.³⁷

Transport

The Convention mandates that hazardous and other wastes mentioned under Annex 1 of the Convention, such as the wastes that are generated from the manufacture of pharmaceutical products referred to in Y2 and the pharmaceutical wastes referred to

³² *Id.* Annexure VIII.

³³ Id. art. 4.1(a).

³⁴ Id. art. 4.1(b).

³⁵ *Id.* art 4.1(c).

³⁶ *Id.* art. 4.2(e).

³⁷ Id. art. 4.7(b).

in Y3, must be supplemented by a "movement document" containing the information of the points where the transboundary movement commenced and ended³⁸.

Waste Disposal

The Convention mandates that every party shall ensure the availability of adequate resources for the eco-friendly disposal of hazardous and other pharmaceutical wastes as mentioned under Annexure 1.³⁹ The parties are also under an obligation to ensure that the persons in-charge (such as waste management personnel as well as the manufacturers) for the disposal and management of hazardous and other wastes are taking all the necessary steps for the prevention of pollution.⁴⁰

BASEL CONVENTION: TECHNICAL GUIDELINES ON THE ENVIRONMENTALLY SOUND MANAGEMENT OF BIOMEDICAL AND HEALTHCARE WASTES, 2003

The Technical Guidelines on the Environmentally Sound Management of Biomedical and Healthcare Wastes, 2003 are based on a number of national guidelines passed by the developing and developed countries, papers published by the European Committee for Standardization as well as the World Health Organisation.⁴¹ These Guidelines provide the details regarding the proper handling of wastes from the private and public healthcare establishments. The information contained therein takes due account of the management requirement of the recovery and disposal measures along with the hygiene requirements. In view of the various levels of waste management infrastructure, resources and capacity among different parties, the Guidelines provide feasible and suitable solutions for every party.⁴² In that spirit, these Guidelines set out how to move towards state-of-the-art management of the healthcare and biomedical waste while at the same time identifying other types of appropriate options.⁴³

³⁸ Id. art. 4.7(c).

³⁹ *Id.* art. 4.2(b).

⁴⁰ Id. art. 4.2(c).

⁴¹ *Technical Guidelines on the Environmentally Sound Management of Biomedical and Healthcare Wastes* 2003, http://archive.basel.int/pub/techguid/tech-biomedical.pdf (last visited Dec. 04, 2020).

⁴² Id.

⁴³ Id.



Figure 2: Biomedical and Healthcare waste strategy suggested under the Guidelines⁴⁴

IDENTIFICATION OF PHARMACEUTICALS AS A BIO-MEDICAL WASTE

Paragraph 23 of the Guidelines provides the reasons as to why the biomedical wastes are hazardous.⁴⁵ Most of the chemicals and pharmaceuticals used in health-care facilities are dangerous substances (e.g.: corrosive, toxic, shock-sensitive, flammable, cytotoxic, explosive, reactive or genotoxic). Usually, these dangerous substances will be found in health-care and biomedical wastes after their use or when they are no longer needed. The disinfectants that are used in large quantities in health-care facilities for cleaning purposes also come in the category of hazardous chemicals due to their corrosive properties. It is pertinent to note that these reactive chemicals may form highly toxic secondary compounds. The residuary chemicals that are often discharged into sewage systems can have possible harmful effects on the activities of natural ecosystems of the receiving waters or on the biological sewage treatment plants. In the same way, pharmaceutical residues may also have possible harmful effects, as they include drugs, antibiotics, antiseptics, disinfectants and heavy metals such as phenols, mercury and their derivatives.

WASTE MANAGEMENT GUIDELINES FOR PHARMACEUTICAL WASTES

Pharmaceutical wastes as per the Guidelines constitute a hazardous healthcare waste. Healthcare waste is also defined as the solid or liquid waste that is discharged from



⁴⁴ Id.

⁴⁵ Id. ¶ 23.

healthcare facilities.⁴⁶ The Guidelines then continue to list the categories of hazardous wastes that are discharged from healthcare facilities under Paragraph 16(a), which include toxic, chemical or pharmaceutical waste, including cytotoxic drugs⁴⁷.

A) Pharmaceutical wastes

- Pharmaceutical waste is a pharmaceutical product that has become unusable for the following reasons:
 - Exceeded expiration date;
 - Expiration date exceeded after the packaging or the ready-to-use preparation prepared by the user has been opened;
 - Other reasons (e.g.: call-back campaign).

The Guidelines divide pharmaceutical wastes into 3 classes as follows:

- Class I –These are the pharmaceuticals such as chamomile tea and cough syrup that do not pose a risk during collection, intermediate storage and waste management. This Class of wastes is generally not considered as hazardous wastes and is treated jointly with municipal wastes.
- Class II –These are the pharmaceuticals which have the tendency of posing potential hazard, if used in an improper way by unauthorized persons. This Class of waste is categorized into hazardous wastes and is treated in an appropriate waste disposal facility.
- Class III –These are heavy metal containing and unidentifiable pharmaceuticals which are required to be managed in a special manner due to their composition. This Class of waste is categorized into hazardous wastes and is treated in an appropriate waste disposal facility.

The Guidelines suggest that wastes generated from pharmaceutical plants must be inspected regularly. Expired drugs can be returned to the producer or pharmacy within a reasonable period of time and possibilities to reuse such drugs after treatment must be explored. However, in case of hazardous wastes mentioned under Class II and Class III type pharmaceuticals, it is required to be stored in an intermediate area which can be accessed only by trained personnel before it is properly disposed through various waste disposal mechanisms.⁴⁸

⁴⁶ *Id.* ¶ 15.

⁴⁷ *Id.* ¶ 16(a).

⁴⁸ Id. B3.

B) Cytotoxic Pharmaceutical Wastes

These are the wastes that may arise from the use (administration to patients) and from the preparation and manufacturing of those pharmaceuticals which have cytotoxic (antineoplastic) effect.⁴⁹ A possible health risk to the persons handling such cytotoxic drags is largely due to the carcinogenic, mutagenic and teratogenic effects of these compounds. These wastes typically occur in central locations such as laboratories and pharmacies, and they are also frequently found at places where cytotoxic solutions are prepared. The storage of such wastes in impermeable and covered containers must be strictly regulated. It is advised to use coded containers, and for the purpose of occupational safety, the cytotoxic wastes must be collected separately and their disposal should be done in hazardous waste incineration plants.

WASTE MANAGEMENT AND DISPOSAL FACILITIES TO BE KEPT IN PLACE

The Guidelines recommended for an environmental management-based waste management plan with ISO 14001 environmental standards. Such kind of systems help in ensuring verifiable and auditable documentation is available for demonstrating that the operation is being carried out as required, and in providing quality information and data on which a state-of-the-art environmental report can be prepared.

Packaging

The Guidelines suggested that the input required for the management of packaging waste can be reduced when preference is given to items containing limited amounts of packaging; preference is given to the packaging of product which may be reused, refilled or otherwise used as a supply or disposal container inside or outside the facility at which the product is used; preference is given to demand-oriented package sizes and when placing an order, the manufacturer or supplier of the product is required to take back the associated containers and transport packaging.⁵⁰

Segregation and handling of biomedical waste

Health-care and biomedical wastes should be separated and collected in accordance with their specific disposal or treatment requirements.⁵¹ The Guidelines also recommended that the waste containers that are made of non-halogenated leak proof



⁴⁹ Id. B4.

⁵⁰ *Id.* ¶ 48.

⁵¹ *Id.* ¶ 54.

combustible materials should always be given priority over other materials.⁵² The Guidelines propose that the WHO color coded scheme can be implemented as shown below as a potential way to mark waste:

Type of Waste	Colour of Container and Markings*	Type of container
Highly infectious waste	Yellow, marked "HIGHLY INFECTIOUS"	Strong, leakproof plastic bag, or container capable of being autoclaved
Other infectious waste, pathological	Yellow	Plastic bag or containers
Sharps	Yellow, marked "SHARPS"	Puncture-proof containers
Chemical and pharmaceutical waste	Brown	Plastic bag or container
Radioactive waste**		Lead box, labelled
General health-care waste	Black	Plastic bags

TABLE - 9

* Proposed colour coding and marking system; the use of the other colour coding in a country is possible. ** Generated only in major hospitals.

Table: WHO - recommended colour coding for biomedical and health-care waste as an example of a colour-coding system⁵³

Transport

The Guidelines recommend that the storage and transfer of waste containers should be reduced in order to minimize the risk of exposure to waste.⁵⁴ The carts used for the transportation of healthcare and biomedical wastes should be designed in a way that they do not spill and the material used in their making should be capable of withstanding exposure to common cleaning agents. Before its disposal, if it is needed to be deposited in a storage cell, the cleanliness of the cell, and that the cell has sufficient number of entry and exit points, and is designed to withstand the accumulation of such waste and prevent the toxicity of such waste from escaping from the cell, must also be ensured.⁵⁵

⁵² *Id.* ¶ 58.

⁵³ *Id.* Table 2.

⁵⁴ *Id.* ¶ 63.

⁵⁵ Id. ¶ 67.

Methods for treatment and disposal

For pharmaceutical wastes, the Guidelines suggest the use of the following methods:

- **Drum or brick incinerator**⁵⁶ It reduces the weight and volume of the wastes. Once the treatment has been completed the residue can be disposed of in a landfill and then the need for highly qualified personnel is not required. However, this method does not ensure the destruction of all micro-organisms. Certain pharmaceutical chemicals may persist.
- **Chemical disinfection**⁵⁷ This is an environmentally-sound, low investment method and is best suited for microbiological content waste. However, in case of pharmaceutical waste not penetrable with steam, this method is not advisable.

The Guidelines strictly prohibit the dumping of pharmaceutical waste in landfills.⁵⁸ The Guidelines also recommend the appointment of a Waste Management Officer (WMO) to work with the officer appointed by the pharmaceutical manufacturer in order to ensure that the Guidelines are complied with.⁵⁹

TREATMENT OF PHARMACEUTICAL WASTES IN INDIA

Current Drug Pollution Crisis in India

India currently holds the third position in the world with respect to its volume of pharmaceutical production.⁶⁰ While India continues to develop its pharmaceutical industry by providing various incentives to drug manufacturers, the government has failed to take note of management of wastes discharged by these industries. Pharmaceutical wastes are especially dangerous considering their content of toxic microbes and other biological compounds that are discharged into streams and other water bodies and end up being consumed by livestock and humans. While India has several legislations and rules that look into preventing and managing bio-medical waste, there is no particular legislation yet that specifically deals with curbing antibiotic residue in wastes.

⁶⁰ *Pharmaceutical Drug Manufacturers,* PDM, http://www.pharmaceutical-drug-manufacturers.com/ news/india-3rd-largest-producer-pharmaceuticals.html (last visited May 30, 2020).



⁵⁶ *Id.* Table 4.

⁵⁷ *Id.* Table 4.

⁵⁸ *Id.* ¶ 124.

⁵⁹ *Id.* ¶ 167.

Nevertheless, the growth of the pharmaceutical industry has come at a price that is detrimental to the environment. Toxic chemicals are widely used for the manufacture of drugs. A number of studies have confirmed pollution of water, air and soil at and around the bulk drug manufacturing facilities in Cuddalore, Baddi, Patancheru and other locations.⁶¹ Hyderabad was the focus of many national and international investigations, several of which found ground water in the area to be polluted with toxins like arsenic, cadmium, lead and vanadium at several thousand times higher concentration than those recommended by the Bureau of Indian Standards and the World Health Organisation.⁶²

In addition to the toxic emissions from manufacturing, there is an equal risk of antibiotic pollution. During the drug manufacturing process, Active Pharmaceutical Ingredients (APIs) are released into the atmosphere.⁶³ In case of antibiotics, the release of untreated APIs into the drainage systems has been shown to lead to the spread of Anti-microbial Resistance (AMR).⁶⁴ AMR occurs when fungi, bacteria, parasites and viruses develop resistance to certain antibiotics, rendering them ineffective and making once curable infections, such as tuberculosis, more difficult or even impossible to fight off.⁶⁵ However, India faces one of the world's largest burdens of drug resistant diseases, including tuberculosis. Approximately 130,000 or 27% of the world's tuberculosis cases are reported in India.⁶⁶ It is double the number of cases in China, which has the second-highest number of people with tuberculosis worldwide. It is estimated that there will be two million deaths in India due to tuberculosis by 2050.⁶⁷ The National Green Tribunal in the year 2019 had ordered a report on Musi

⁶⁷ Avika Dixit, Antimicrobial resistance: Progress in the decade since emergence of New Delhi metallo-βlactamase in India,44 INDIAN JOURNAL OF COMMUNITY MEDICINE 4 (2019).



⁶¹ *Problem of pharmaceutical pollution,* EEB, https://eeb.org/the-problem-of-pharmaceutical-pollution/ (last visited May 30, 2020).

⁶² Hyderabad's Pharmaceutical Pollution Crisis: Heavy Metal and Solvent Contamination At Factories In A Major Indian Drug Manufacturing Hub, CHANGING MARKETS, http://changingmarkets.org/wp-content/ uploads/2018/01/CM-HYDERABAD-s-PHARMACEUTICAL-POLLUTION-CRISIS-EX-SUMMARY-WEB-SPREAD.pdf (last visited May 30, 2020).

⁶³ Id. at 3.

⁶⁴ Susan A Kraemer, *Antibiotic Pollution in the Environment: From Microbial Ecology to Public Policy*, NCBI (June 22, 2019), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6616856/.

⁶⁵ *Id.* at ¶ 8.

⁶⁶ Teena Thacker, *India continues to record maximum number of tuberculosis (TB) cases*, The Economic Times (Oct. 17, 2019), https://economictimes.indiatimes.com/news/politics-and-nation/india-continues-to-record-maximum-number-of-tuberculosis-tb-cases-/articleshow/71638359.cms?from=mdr.

River in Hyderabad to assess the level of antibiotic contamination.⁶⁸ The researchers from BITS Pilani Hyderabad in their report to the NGT found that all 90 bacterial strains they isolated from 54 water samples were multi-drug resistant and some of them were extremely drug resistant.⁶⁹

Drug Pollution in Hyderabad

German scientists in the year 2016 found that all the specimens obtained from the sampling sites in bulk manufacturing facilities' direct environment in Hyderabad and in the nearby villages were contaminated with antimicrobials.⁷⁰ Researchers also found that 95% contained extremely high levels of bacteria and fungi that were immune to antibiotics.⁷¹ These results led the researchers to conclude: 'Insufficient wastewater management at bulk drug manufacturing facilities contributes to the unprecedented contamination of water bodies with antimicrobial drugs, which appears to be correlated with the collection and distribution of carbapenemase-producing pathogens.⁷²

Hyderabad is home to 50 percent of India's drugs exports with approximately 170 companies operating in the city.⁷³ The German media company NDR, in a study, found that 19 companies operating in Hyderabad were suppliers of antibiotics to the European market. Notwithstanding NGOs, the regulatory and judicial pressures on companies operating in the region to perform eco-friendly operations, this severe degree of contamination by pharma industries persists. ⁷⁴In the year 2009, the

⁷⁴ *Patancheru-Bollaram pollution causing genetic deformities*, THE NEW INDIAN EXPRESS (Jan 10, 2019), https://www.newindianexpress.com/states/telangana/2019/jan/10/patancheru-bollaram-pollution-causing-genetic-deformities-1923129.html.



⁶⁸ V. Nilesh, *Study raises alarm over presence of antibiotic-resistant bacteria in Hyderabad's Musi river*, THE NEW INDIAN EXPRESS (Nov. 30, 2019), https://www.newindianexpress.com/cities/hyderabad/2019/ nov/30/study-raises-alarm-over-presence-of-antibiotic-resistant-bacteria-in-hyderabads-musiriver-2069169.html.

⁶⁹ *Id.* at ¶ 5.

⁷⁰ *Case Study: Contaminated waters in Hyderabad, India,* PHARMACEUTICAL TECHNOLOGY, https://www.pharmaceutical-technology.com/features/pharma-and-the-environment-pollution-trend/#:~:text=Case%20study%3A%20contaminated%20water%20in%20Hyderabad%2C%20 India&text=They%20also%20found%2095%25%20contained,fungi%20resistant%20to%20 antibiotic%20drugs.&text=This%20grievous%20level%20of%20pharma,to%20clean%20up%20 their%20act (last visited May 30, 2020).

⁷¹ *Id.* at ¶ 4.

⁷² SANDRA D'SA, DEBASIS PATNAIK, THE IMPACT OF THE PHARMACEUTICAL INDUSTRY OF HYDERABAD IN THE POLLUTION OF THE GODAVARI RIVER 34 (2020).

⁷³ Rahul Devulapalli, *Lakes on Drugs*, THE WEEK (Jan. 4, 2020), https://www.theweek.in/theweek/ cover/2020/01/03/lakes-on-drugs.html.

Patancheru-Bolaram region was listed as 'critically polluted' in India's National Pollution Index, and in the year 2016, the country's Supreme Court ordered pharma companies to implement a zero liquid waste policy.⁷⁵ Research has noted that "contamination of water supplies with antimicrobial drugs (combined with excessive use of antibiotics and poor sanitation) has had serious implications in India, where an estimated 58,000 newborns die each year from multidrug-resistant infections."⁷⁶

The first case of industrial pollution in the Patancheru- Bolaram area was filed in 1990.⁷⁷ Various branches of the judiciary have issued directives and made comments on the matter since then. The original case sought remedial action pursuant to Article 32 of the Constitution, calling for the government to provide drinking water to people affected by industrial contamination in the area. In October, 2001, the Supreme Court referred the case to the High Court of Andhra Pradesh, which subsequently transferred the case to the NGT in 2013. In 2017, after finding that the State had not improved the quality of groundwater even after decades of litigation, the NGT passed an order. The NGT ordered the Telangana government to restore all water bodies, supply all affected villages with drinking water and recover the costs from industrial units. Nevertheless, the directions of the NGT have not yet provided any relief to the people, forcing the NGT to issue a strongly worded judgment on 16th November, 2019 demanding punitive action against officials of the Telangana State Pollution Control Board.⁷⁸

The huge scale of pollution from drug manufacturing has prompted the Indian public health experts, advocacy groups and local citizens to call on the European Union (EU) to reform the good industrial practices and to incorporate these criteria during factory inspections. The letter follows on from the EU's declaration that it had abandoned efforts to crack down pharma pollution. While the Drugs and Cosmetics Act, 1940 and the Allied rules themselves recommend "Good Manufacturing Practices" under its Schedule, these are seldom practiced by industries.

⁷⁵ Paryavran Suraksha Samiti v. Union of India, WPC 375/2012.

⁷⁶ Laxminarayan R & Heymann DL, Challenges of drug resistance in the developing world, 344 BMJ 1567 (2012).

⁷⁷ Indian Council for Enviro Legal Action & Others v. Union of India & Others, Writ Petition (Civil) No.1056/1990.

⁷⁸ V. Nilesh, '*Will go after PCB chief, member secretary if action not taken against polluting industries*', The New Indian Express (Nov. 17, 2019), https://www.newindianexpress.com/cities/hyderabad/2019/nov/17/ will-go-after-pcb-chief-member-secretary-if-action-not-taken-against-polluting-industries-2062912. html.



WASTE MANAGEMENT SYSTEMS IN INDIA

Figure 3: Origin and routes of pharmaceutical products79

Environmental pollution management in the bulk drug industry needs a high degree of qualified manpower due to the nature of its pollutants. In general, it has been noted that the purity of the finished product is of significant concern to the industry. Rejections (unreacted/converted portion of raw materials) thus add to the main emissions burden on the industry. The industry requires a number of batch reactors to obtain the appropriate product and each reaction produces various types of contaminants depending on the specific reactants and process.⁸⁰ There are a variety of streams with different characteristics that come from various parts of the sector, requiring segregation and adequate treatment instead of the traditional end-of-pipe treatment scheme for combined effluents. The potential for air pollution is also important, although the amount of air pollutants may not be large. Nevertheless, hazardous pollutants must be properly captured and handled. Solid waste produced by these industries comes under hazardous categories, requiring compliance with the regulations for the management of hazardous waste.

⁷⁹ M.H Sayadi, *Pollution of Pharmaceuticals in Environment*, JOURNAL OF INDUSTRIAL POLLUTION CONTROL, http://www.icontrolpollution.com/articles/pollution-of-pharmaceuticals-in-environment-.php? aid=37518 (last visited May 30, 2020).

⁸⁰ Lübbert, C. et al., Environmental pollution with antimicrobial agents from bulk drug manufacturing industries in Hyderabad, South India, is associated with dissemination of extended-spectrum beta-lactamase and carbapenemase-producing pathogens, 45 Springer Link 479, 481 (2017).

TABLE – 10: Requirements as per the CPCB Guidelines for Bulk Drug Manufacturing Industries⁸¹

TECHNOLOGIES/CURRENT PRACTICES	REQUIREMENTS
Wastewater treatment	Wastewater treatment
Collection of all the streams and providing collective treatment (end-of-the-pipe treatment) as follows:	 In-plant pollution control measures Process optimisation/modifications to avoid untreatable pollutants generation
 Collection tanks - For separation of carbon black (usually used for the colour removal of the final product). Oil & Grease trap - conventional separator 	• Segregation of effluent streams and characterisation for separate treatment as necessary
 Equalisation tank Neutralisation Primary clarification 	• Salt recovery from high TDS (inorganic) containing streams through forced evaporation system.
Biological treatment (mostly activated sludge process and lagoons)Secondary clarifier	• Efficient solvent recovery systems.
Air Pollution Control Systems	Air Pollution Control Systems
 Scrubbers for point source emissions Cyclone to control emission Suitable stack height for appropriate dispersion 	 Properly designed chlorine storage facility with automatic control equipment Collection of fugitive emissions from the processing sections and loading/ unloading sections through hoods & ducts and providing control equipment such as absorption/ adsorption systems Multi-cyclones or bag filters for control of emissions from boilers Continuous monitoring equipment/ sensors to be provided
Solid/ hazardous waste management	Solid/hazardous waste management
 Empty drums are sold to third party for reuse. Process residues are stored in drums ETP primary sludge is sent sludge drying beds Oil & grease is collected & burnt in boilers 	 The process residues and other hazardous wastes generated in the industry should be stored/treated/ disposed as per the Hazardous Waste Management & Handling Rules, 1989 Proper incineration of organic residues, instead of burning in boiler, which leads to air pollution problem Detoxification of empty drums/bags etc, before selling and to maintain good

81 *Bulk Drugs Manufacturing Industry*, CPCB, http://www.cpcbenvis.nic.in/cpcb_newsletter/ Technologies%20for%20Pollution%20Control%20Industry.pdf (last visited May 30, 2020).

TABLE – 11: Treatment options/combinations based on nature of wastes and effluents generated by the bulk drug manufacturing industries as per CPCB Guidelines⁸²

QUALITY OF EFFLUENT	TREATMENT OPTIONS			
Waste is not easily bio-degradable but toxic	1. Thermal decomposition (based on calorific value)			
	2. Chemical oxidation by hydrogen peroxide, ozone etc.			
	3. Evaporation + Secure landfill			
May be toxic; not suitable for biological treatment; mostly inorganic salts	1. Chemical treatment (recovery, precipitation etc.)			
	2. Evaporation + Secure land-fill of evaporated residue			
Highly organic effluent fully biodegradable	1. Anaerobic + Aerobic treatment			
	2. If quantity is less, incineration (based on calorific value) + Secure land-fill of incineration ash			
Only inorganic salts, no need for biological	1. Solar evaporation			
treatment	2. Forced evaporation (after separation of volatile organic matter)			
	3. Reverse osmosis			
Highly organic effluent, may not be easily	1. Thermal decomposition			
biodegradable	2. Chemical oxidation by hydrogen peroxide or ozone or sodium, hypochlorite etc.			
	3. Chemical + biological treatment			
Highly inorganic effluent, not suitable for	1. Chemical recovery			
biological treatment	2. Chemical oxidation + biological treatment			
Organic effluent, fully biodegradable	1. Anaerobic + aerobic treatment			
Low organic and low inorganic effluent	1. Recycle and reuse (after preliminary treatment)			

STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS

The Stockholm Convention is a global treaty to protect human health and the environment from contaminants that remain intact in the atmosphere for a long period of time, are widely spread globally, accumulate in the fatty tissues of humans and animals, and have adverse effects on human health or the atmosphere.⁸³ Exposure to Persistent Organic Pollutants (POPs) may contribute to significant health issues including certain cancers, birth anomalies, defective reproductive

⁸² *Bulk Drugs Manufacturing Industry*, CPCB, http://www.cpcbenvis.nic.in/cpcb_newsletter/ Technologies%20for%20Pollution%20Control%20Industry.pdf (last visited May 30, 2020).

⁸³ *Overview*, UNO, http://www.pops.int/TheConvention/Overview/tabid/3351/Default.aspx (last visited May 30, 2020).

and immune systems, increase disease vulnerability and damage to the central and peripheral nervous systems.⁸⁴ India signed the Convention on May 14, 2002, ratified it on January 13, 2006 and brought it into force on April 13, 2006.⁸⁵

This Convention is relevant to the pharmaceutical sector in India as a certain Persistent Organic Pollutant, commonly used in making drugs has been mentioned under Annexure A of the Convention. This drug is Lindane and is used to treat scabies and lice.⁸⁶ It is also used in agriculture as a pesticide.⁸⁷ This chemical was completely banned from being imported into India by way of a Notification passed by the Ministry of Agriculture on 23rd March, 2011.⁸⁸ However, this Notification covered the ban of Lindane only as a pesticide from import, export and manufacture. This chemical however is still widely used in the pharmaceutical sector and is also sold and distributed in India.⁸⁹ However, as per the Stockholm Convention, the use of Lindane in pharmaceutical products is permitted. The POP chemicals mentioned under Annexure A of the Stockholm Convention are mainly used in the manufacture of pesticides. Lindane is listed under Annex A of the Convention. The production and use of the chemicals listed under Annex A must be reduced and eliminated over time by the Parties. However, specific exemptions for use or production are listed in the Annex that only applies to those Parties that register for them.

However, the Ministry of Environment in tandem with its obligations under the Stockholm Convention has taken several steps to curb the use of POPs and more importantly the discharge of these POPs into water bodies. The Regulation of Persistent Organic Pollutants Rules, 2018⁹⁰ bans the manufacture, use, trade, export and import of the seven chemicals, namely, Hexabromobiphenyl, Chlordecone, Tetrabromodiphenyl ether and pentabromodiphenyl ether, Hexabromodiphenyl ether and heptabromodiphenyl ether, Hexabromocyclododecane,Pentachloro benzene, and Hexachlorobutadiene. These chemicals are primarily used in pesticides.

⁸⁴ *Persistent Organic Pollutants,* WHO, https://www.who.int/foodsafety/areas_work/chemical-risks/ pops/en/ (last visited May 30, 2020).

⁸⁵ *Status of ratification*, UNO, http://chm.pops.int/Countries/StatusofRatifications/PartiesandSignatoires/tabid/4500/Default.aspx (last visited May 30, 2020).

⁸⁶ Compound Summary: Lindane, PUBCHEM, https://pubchem.ncbi.nlm.nih.gov/compound/Lindane.

⁸⁷ *Id.* at ¶ 4.

⁸⁸ *List Of Pesticides Which Are Banned, Refused Registration And Restricted In Use,* PPQS (Oct. 31, 2019), http://ppqs.gov.in/sites/default/files/banned_restricted_phased_out_31.10.2019.pdf.

⁸⁹ Yue Xu, Assessing Cancer Risk in China from γ-Hexachlorocyclohexane Emitted from Chinese and Indian Sources, NCBI, https://pubmed.ncbi.nlm.nih.gov/23710890/ (last visited May 30, 2020).

⁹⁰ Regulation of Persistent Organic Pollutants Rules, 2018, Rule 2.

The use of Lindane in India

In India, lindane formulations are licensed for use in pharmaceutical products to regulate scabies and head lice on people.⁹¹ This was also licensed in 2005 for use in the control of rats, fleas, cockroaches, mosquitoes, bed bugs and beetle populations. In agriculture, it has been registered for pest control in sugarcane, cotton, cabbage, walnut, apple, okra, maize, cauliflower, tomato, potato, beans and cucumber.⁹² Within the public health sector, a number of years ago, the Ministry of Health initiated a push to use lindane to monitor malaria vectors, which had been withdrawn due to commercial obstacles relating to the procurement and costs. There is currently no policy to phase out lindane in India.⁹³ In fact, the license for lindane productions is readily available to the government agency concerned. However, the Ministry of Agriculture prohibited the manufacture, import and formulation of Lindane (Gamma-HCH) vide Gazette Notification No S.O.637(e) dated 25/03/2011 with effect from 25 March 2013. ⁹⁴

Lindane production has declined rapidly in recent years, leaving only a small number of producing countries (Romania and India) behind. In India, a ban on the use of technical HCH was introduced in 1997, but limited use of lindane was allowed. In India, the lindane industry is still manufacturing.⁹⁵ The production of lindane in China was halted in 2003. Exact information on existing production capacities is not available, but it is estimated that between 1300 tons and a maximum of 2000 tons of lindane is currently produced each year.

⁹¹ CAPE, *Lindane's Dirty Sectret: Indian Facilities Dump Toxic Wastes*, PANNA, https://www.panna.org/ sites/default/files/lindaneDirtySecret-2.pdf (last visited May 30, 2020).

⁹² Central Insecticide Board and Registration Committee, Dept. of Plant Protection and Quarantine, Ministry of Agriculture, India.

⁹³ CAPE, *Lindane's Dirty Sectret: Indian Facilities Dump Toxic Wastes*, PANNA, https://www.panna.org/ sites/default/files/lindaneDirtySecret-2.pdf (last visited May 30, 2020).

⁹⁴ *Pesticides Banned in India,* DIRECTORATE OF PLANT PROTECTION (Oct. 31, 2019), http://ppqs.gov.in/sites/ default/files/banned_restricted_phased_out_31.10.2019.pdf.

⁹⁵ Vijgen et al, The legacy of Lindane and Technical HCH Production, 68 ORGANOHALOG COMP. 771 (2005).



Graph 1: Lindane production levels in India96

REGULATION OF **POPs** UNDER THE **S**TOCKHOLM CONVENTION

Transport

The Convention stipulates that the chemicals referred to in Annexure A shall be handled, processed, transported and stored in an eco - friendly manner.⁹⁷They must not be transported across international borders without taking into account relevant international standards, rules and guidelines.⁹⁸ Annexure D specifies the details to be given where the POP will be transported over long distances. It includes – chemical identification, durability, bioaccumulation, the potential for long-term environmental transport and adverse effects.

Disposal

Article 6(1)(e) of the Stockholm Convention specifies that the disposal of POPs should be done in such a way that the persistent organic pollutant material is destroyed or irreversibly transformed in such a way that it does not exhibit the characteristics of persistent organic pollutants.⁹⁹ The POPs are not allowed to be subject to disposal

⁹⁹ Stockholm Convention, art. 6.1(e).



⁹⁶ India Chemical: Production: Pesticides and Insecticides: Lindane, CEIC, https://www.ceicdata.com/ en/india/chemical-production-by-product/chemical-production-pesticides-and-insectides-lindane (last visited May 30, 2020).

⁹⁷ Stockholm Convention, art. 6.1(d).

⁹⁸ Stockholm Convention, art. 6.1(d).

operations by the State which can lead to preservation, recycling, recovery, direct reuse or alternative use of persistent organic pollutants.¹⁰⁰

STRATERGIC APPROACH TO INTERNATIONAL CHEMICALS MANAGEMENT (SAICM), 2006

The Strategic Approach to International Chemicals Management (SAICM), adopted by the First International Conference on Chemicals Management (ICCM1) on 6th February, 2006 in Dubai, is a policy mechanism to promote chemical health around the world.¹⁰¹ SAICM was established by a multi-stakeholder and multi-sectoral Preparatory Committee and supports the achievement of the 2020 goal agreed at the World Summit on Sustainable Development in Johannesburg in 2002.¹⁰² SAICM's ultimate goal is to achieve a sound management of chemicals over their life cycle so that, by 2020, chemicals are generated and used in ways that reduce major adverse effects on human health and the environment.¹⁰³

Emerging Policy Issue: Environmentally Persistent Pharmaceutical Pollutants

The Fourth International Conference on Chemicals Management (ICCM4) adopted Environmentally Persistent Pharmaceutical Contaminants as an emerging policy concerning the sense of SAICM, while acknowledging that pharmaceuticals have significant benefits for animal welfare and human health.¹⁰⁴ In adopting this issue, ICCM4 agreed that international cooperation is crucial to build awareness and promote action on the issue. ICCM4 considered that the dissemination of information and raising awareness on environmentally persistent pharmaceutical contaminants is especially important and that enhancing the quality and access of information on these chemicals is a priority.¹⁰⁵ It also acknowledged the existing information gaps on exposure and the effects of environmentally persistent pharmaceutical pollutants

¹⁰⁰ Stockholm Convention, art. 6.1(d).

¹⁰¹ SAICM Overview, SAICM http://www.saicm.org/About/SAICMOverview (last visited May 30, 2020).

¹⁰² Strategic Approach to International Chemicals Management (SAICM), UNEP, http://chm.pops.int/ Partners/UNEP/SAICM/tabid/4143/Default.aspx (last visited May 30, 2020).

¹⁰³ *Id.* at ¶ 5.

¹⁰⁴ *Environmentally Persistent Pharmaceutical Pollutants*, SAICM, http://www.saicm.org/Implementation/ EmergingPolicyIssues/PharmaceuticalPollutants/tabid/5477/language/en-US/Default.aspx (last visited May 30, 2020).

¹⁰⁵ Fourth session of the International Conference on Chemicals Management (ICCM4), SAICM, http:// www.saicm.org/Meetings/ICCM4/tabid/5464/language/en-US/Default.aspx (last visited May 30, 2020).

and agreed to introduce cooperative measures with the ultimate objective of raising awareness and understanding among the policy makers and other stakeholders.¹⁰⁶

The resolution encourages governments and other stakeholders to produce and exchange information to resolve established knowledge gaps and requires all stakeholders and organisations to provide support, including expertise, financial and in-kind services, on a voluntary basis for cooperative action, including their involvement in the creation and distribution of relevant information and guidance.¹⁰⁷ Relevant member organisations of the Inter-Organisation Program for the Sound Management of Chemicals will guide and promote cooperative action and are currently developing a work plan on environmentally persistent pharmaceutical contaminants.

Risks associated with Environmentally Persistent Pharmaceutical Pollutants (EPPP)

There are three key channels through which pharmaceutical drugs enter the environment which are: escapes during production processes; animal and human excretion; and discarded or expired pharmaceutical products from households or hospitals.¹⁰⁸ While research has shown that pharmaceuticals and personal care products (PPCPs) are present in water bodies around the world, no studies have shown their direct impact on human health. Nevertheless, the lack of scientific evidence cannot rule out the likelihood of adverse effects due to exposures or long-term interactions to such substances. Because the quantities of these chemicals in the water supply may be in parts per billion or parts per trillion, it is difficult to chemically determine the exact amounts present.¹⁰⁹ Many studies¹¹⁰ have therefore been based on determining whether concentrations of these pharmaceuticals exist in or above the accepted daily intake (ADI) at which the expected biological outcomes that occur.¹¹¹

¹¹¹ Id. at 37.



¹⁰⁶ *Id.* at ¶ 3.

¹⁰⁷ Fourth sessions of the International Conference on Chemicals Management (ICCM4), EUROPA.EU, https://europa.eu/capacity4dev/unep/event/fourth-sessions-international-conference-chemicals-management-iccm4 (last visited May 30, 2020).

¹⁰⁸ Pharmaceutical Pollutants under the Spotlight, SAICM, http://www.saicm.org/EmergingPolicyIssues/ Pharmaceuticalnbsp;Pollutants/PharmaceuticalPollutantsundertheSpotlight/tabid/5515/language/en-US/Default.aspx (last visited May 30, 2020).

¹⁰⁹ *The Problem Of Pharmaceutical Pollution*, EEB, https://eeb.org/the-problem-of-pharmaceutical-pollution/ (last visited May 30, 2020).

¹¹⁰ *Pharmaceuticals in Drinking-water*, WHO, https://www.who.int/water_sanitation_health/publications/2011/pharmaceuticals_20110601.pdf.

The most surprising findings from the study of the global database of predominant concentrations of many pharmaceutical substances have shown that the marine environment within the spectrum of these pharmaceutical toxins is known to cause ecotoxic effects in aquatic environments. Although similar conclusions have been drawn in other publications, the global perspective of the database has brought a new dimension to this emerging problem. The non-steroidal anti-inflammatory drug 'diclofenac' caused the near-extinction of vultures in the Indian subcontinent due to the birds feeding on carcasses of cattle treated with anti-inflammatory drug diclofenac.¹¹² Diclofenac is known to cause damage to thinner organs of rainbow trout in aquatic environments.¹¹³ Assessing the collected database Measured Environmental Concentration (MEC), the weighted-average concentrations of diclofenac recorded in surface water surpass the estimated Predicted No-Effect Concentration (PNEC) of diclofenac of 0.1 μ g/L(EC 2013) in 12 countries worldwide, suggesting ecotoxicological threats at the locations examined.

Throughout India, significant media attention has been paid to the high concentrations of pharmaceuticals found throughout wastewater treatment system outflows from manufacturing facilities. In the meantime, many publications are available which also provide data on river, lake and well water near pharmaceutical production sites, e.g., in the Patancheru area, which shows high concentrations of river water downstream of the production facility.¹¹⁴ This is relevant, as a large proportion of the globally sold pharmaceutical products are produced at least partially in Patancheru (e.g. 31% of all Swedish products).¹¹⁵ Therefore, maximum concentrations in Asia are high, with 37 entries in the mg/L range.

¹¹² Gerry Swan, *Removing the Threat of Diclofenac to Critically Endangered Asian Vultures*, NCBI, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1351921/ (last visited May 30, 2020).

¹¹³ Filip Cuklev, ErikKristiansson, Diclofenac in fish: Blood plasma levels similar to human therapeutic levels affect global hepatic gene expression, 30 Environmental Toxicology Chemistry 2126, 2134 (2011).

¹¹⁴ Drug traces in Patancheru wells, Times of India (Feb. 17, 2009), https://timesofindia.indiatimes.com/ city/hyderabad/Drug-traces-in-Patancheru-wells/articleshow/4138292.cms.

¹¹⁵ Tim aus der Beek, *Pharmaceuticals in the environment: Global occurrence and potential cooperative action under the Strategic Approach to International Chemicals Management (SAICM),* UMWELTBUNDESAMT, https://www.umweltbundesamt.de/sites/default/files/medien/1968/ publikationen/iww_abschlussbericht_saicm_arzneimittel_final.pdf (last visited May 30, 2020).



Figure 4: Number of pharmaceuticals detected in sewage, wastewater treatment plants inflow/ effluent/sludge per country¹¹⁶



Figure 5: Number of pharmaceuticals detected in surface waters, groundwater, tap water, and/or drinking water per country¹¹⁷



Figure 6: Number of pharmaceutical occurrences (left) and number of pharmaceuticals found in surface, drinking, and groundwater (right) in the UN regional group of Asia and the Pacific¹¹⁸

¹¹⁶ *Pharmaceuticals in the environment – The global perspective under SAICM,* UMWELTBUNDESAMT, https://www.umweltbundesamt.de/sites/default/files/medien/1968/publikationen/iww_ abschlussbericht_saicm_arzneimittel_final.pdf (last visited May 30, 2020).

¹¹⁷ *Pharmaceuticals in the environment – The global perspective under SAICM*, UMWELTBUNDESAMT, https://www.umweltbundesamt.de/sites/default/files/medien/1968/publikationen/iww_abschlussbericht_saicm_arzneimittel_final.pdf (last visited May 30, 2020).

¹¹⁸ Id.

MINAMATA CONVENTION ON MERCURY

The Minamata Convention is an international treaty designed to protect the environment and human health from anthropogenic emissions and releases of mercury and mercury compounds.¹¹⁹ India signed the Convention on September 30, 2014 and ratified it on June 18, 2018.¹²⁰ The Convention is relevant to the pharmaceutical sector as mercury is used in the manufacture of pharmaceuticals as well as vaccines.¹²¹

Phasing out of Mercury by 2020 under the Convention

From 2020 onwards, the Convention has banned the manufacture, import and export of mercury-containing goods, including clinical thermometers, blood pressure monitors, high-pressure mercury lamps and topical antiseptic agents. Until 2020, the Convention would encourage the signatory countries to reduce their use of mercury slowly. In the case of small-scale gold mining for which mercury is used indiscriminately, the Convention stipulates a reduction in the use of mercury. The Treaty also states that for the construction of coal-powered thermal power plants, the signatory countries will be required to include equipment that help in minimizing mercury emissions.

Sl. No.	Mercury-added products	Date after which the manufacture, import or export of the product shall not be allowed (phase-out date)
1	Batteries, except for button zinc silver oxide batteries with a mercury content < 2% and button zinc air batteries with a mercury content < 2%	2020
2	Switches and relays, except very high accuracy capacitance and loss measurement bridges and high frequency radio frequency switches and relays in monitoring and control instruments with a maximum mercury content of 20 mg per bridge, switch or relay	2020

TABLE - 12:	Mercury	products to	be	phased	out ¹²²
	nier eur j	produces to	~~	pinasea	

122 Minamata Convention, 2013, Annex A.

¹¹⁹ *Minamata Convention on Mercury to enter into force,* UNIDO (May 19, 2017), https://www.unido.org/ news/minamata-convention-mercury-enter-force.

¹²⁰ Parties and Signatories, UNO, http://www.mercuryconvention.org/Countries/Parties/tabid/3428/language/en-US/Default.aspx (last visted May 30, 2020).

¹²¹ *Minamata Convention On Mercury At A Glance,* MERCURY CONVENTION, http://www.mercuryconvention. org/Portals/11/documents/Awareness%20raising/FACT%20SHEETS/Minamata%20Convention%20 on%20Mercury%20at%20a%20glance_04%2016.pdf (last visited May 30, 2020).

3	Compact fluorescent lamps (CFLs) for general lighting purposes that are \leq 30 watts with a mercury content exceeding 5 mg per	2020
4	Linear fluorescent lamps (LFLs) for general lighting purposes: (a) Triband phosphor < 60 watts with a mercury content exceeding 5 mg per lamp; (b) Halophosphate phosphor \leq 40 watts with a mercury content exceeding 10 mg per lamp	2020
5	High pressure mercury vapour lamps (HPMV) for general lighting purposes	2020
6	Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for electronic displays: (a) short length (\leq 500 mm) with mercury content exceeding 3.5 mg per lamp (b) medium length (> 500 mm and \leq 1 500 mm) with mercury content exceeding 5 mg per lamp (c) long length (> 1 500 mm) with mercury content exceeding 13 mg per lamp	2020
7	Cosmetics (with mercury content above 1ppm), including skin lightening soaps and creams, and not including eye area cosmetics where mercury is used as a preservative and no effective and safe substitute preservatives are available	2020
8	Pesticides, biocides and topical antiseptics	2020
9	The following non-electronic measuring devices except non- electronic measuring devices installed in large-scale equipment or those used for high precision measurement, where no suitable mercury-free alternative is available: (a) barometers; (b) hygrometers; (c) manometers; (d) thermometers; (e) sphygmomanometers.	2020

Minamata Convention and India

In 2001, UNEP attempted to draw up an inventory for the use of mercury in India in the Global Mercury Assessment. According to the UNEP Report, the largest consumer of mercury in India was the chlorine-alkali industry, which consumes approximately 150-200 tons of mercury annually for the production of caustic soda and chlorine.¹²³ India does not manufacture mercury; its domestic requirements are entirely fulfilled by imports.¹²⁴ Such imported mercury metal is used by various industries; however, there is no detailed government data on the use of mercury in India.¹²⁵

¹²³ *Mercury cell chlor-alkali production*, UNEP, https://web.unep.org/globalmercurypartnership/our-work/mercury-cell-chlor-alkali-production (last visited May 30, 2020).

¹²⁴ Vishwas Mohan, *Mercury ban in India within 6 to 10 years*, The Economic Times (Sept. 26, 2014), https://economictimes.indiatimes.com/news/environment/pollution/mercury-ban-in-india-within-6-to-10-years/articleshow/43475389.cms?from=mdr#:~:text=The%20Convention%20gives%20 the%20countries,to%20end%20all%20mercury%20mining.&text=According%20to%20a%20 Delhi%2Dbased,demands%20are%20met%20through%20imports.

¹²⁵ *Technical Background Report for the Global Mercury Assessment 2018*, UNEP, https://web.unep.org/globalmercurypartnership/technical-background-report-global-mercury-assessment-2018 (last visited May 30, 2020).



Figure 7: Graph depicting level of import (blue) and export (green) of mercury in India¹²⁶

As per recent statistics, mercury is mainly used in:

- Thermometers and other measuring devices¹²⁷
- Electronics
- Dentistry¹²⁸
- Mercury containing batteries¹²⁹
- Lighting equipment¹³⁰
- Thermostat switches¹³¹
- Fungicides
- Paints, cosmetics
- Drugs, pharmaceutical products¹³²
- 126 Implementation of the Minamata Convention to manage mercury pollution in India: challenges and opportunities, SPRINGER, https://enveurope.springeropen.com/articles/10.1186/s12302-019-0280-3/figures/1 (last visited May 30, 2020).
- 127 WHO calls for the phase out of mercury fever thermometers and blood pressure measuring devices by 2020, WHO (Oct. 11, 2013), https://www.who.int/news-room/detail/11-10-2013-who-calls-for-the-phase-out-of-mercury-fever-thermometers-and-blood-pressure-measuring-devices-by-2020.
- 128 Monika Rathore, *The Dental Amalgam Toxicity Fear: A Myth or Actuality*, NCBI, (May-Aug, 2012), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3388771/.
- 129 *Mercury in Batteries*, EPA, https://www.epa.gov/mercury/mercury-batteries#:~:text=Today%20 the%20only%20types%20of,all%20other%20types%20of%20batteries (last visited May 30, 2020).
- 130 *IMERC Fact Sheet Mercury Use in Lighting*, NEWMOA (Aug. 25, 2020), http://www.newmoa.org/ prevention/mercury/imerc/FactSheets/lighting.cfm#:~:text=Mercury%20is%20used%20in%20 a,other%20equivalent%20forms%20of%20lighting.
- 131 *Mercury Components in Thermostats*, NEWMOA (Aug. 25, 2020), http://www.newmoa.org/prevention/ mercury/imerc/factsheets/thermostats.cfm#:~:text=Mercury%20thermostats%20use%20mercury%20 switches,air%20conditioning%20(HVAC)%20equipment.&text=A%20mercury%20thermostat%20 may%20contain,and%20cooling%20systems%20it%20activates.
- 132 Mercury and health, WHO (Mar. 31, 2017), https://www.who.int/news-room/fact-sheets/detail/ mercury-and-health.

Traditional uses including Ayurveda and Siddha medicine¹³³



Figure 8: Estimated mercury consumption in different sectors in India.¹³⁴

Mercury is used in medical devices such as sphygmomanometers and clinical thermometers because of its special chemical and physical properties. Such instruments are commonly used in the healthcare sector and are almost regarded and embraced as gold standards by healthcare professionals. A research conducted in the year 2003 suggested that approximately 0.2 million sphygmomanometers and 5 million thermometers have been produced annually in India.¹³⁵ However, this was increased to approximately 0.225 million units per year and 8.32 million units per year respectively, in the year 2012.¹³⁶

Mercury has been used in pharmaceutical products as a preservative to extend the life of these products. And in some cases, mercury was used as a treatment for certain types of diseases. Example, in Merbromin, mercury is used as an adhesive plaster.¹³⁷

¹³³ G. Gnanashanmugam, R. Balakrishnan, Mercury Toxicity Following Unauthorized Siddha Medicine Intake – A Mimicker of Acquired Neuromyotonia - Report of 32 Cases, NCBI (Jan-Mar, 2018), https:// www.ncbi.nlm.nih.gov/pmc/articles/PMC5909146/.

¹³⁴ Implementation of the Minamata Convention to manage mercury pollution in India: challenges and opportunities, Springer, https://enveurope.springeropen.com/articles/10.1186/s12302-019-0280-3/figures/1 (last visited May 30, 2020).

¹³⁵ *Mercury in India: Toxic Pathways,* TOXICSLINK, http://toxicslink.org/docs/bmw/MercuryCamp/ Mercury_In_India_full.pdf (last visited May 30, 2020).

¹³⁶ *Id*.

¹³⁷ PRODUCTS WITH ADDED MERCURY AND RISKS FOR THE ENVIRONMENT AND HEALTH (2020), http://www.mercuryconvention.org/Portals/11/documents/submissions/Products_added_Mercury_ME_Chile_2020.pdf.

Mercury is used in dentistry, particularly in dental amalgam fillings. Dental amalgams are typically 40-50 percent elemental mercury by weight, while the remainder is made up of other metals such as copper, tin, palladium, nickel, etc.¹³⁸ According to a study by Toxics Link, the total mercury used in dental cavities in India is estimated to be 49.6 tons.¹³⁹

In India, the frequency of mercury contamination is expected to be common due to the uncontrolled use of elemental mercury/mercury compounds by various sectors. Contamination of mercury is reported to be widespread in India, in places such as industrial emissions of mercury from iron and steel industry, coal combustion, chloralkali plants, non-ferrous metallurgical plants, waste disposal, cement industry and other minor sources (i.e., brick manufacturing, instruments, clinical thermometers).¹⁴⁰ One such contaminated site was reported in Kodaikanal, a former thermometer plant that was closed in 2001. The contaminated site is located at a notified industrial site, which is "approximately 85,000m above sea level and approximately 2,180 m above sea level at the top of the cliff".¹⁴¹ There have been reports of mercury-laden waste and sludge being disposed of down the hills, contaminating a large area around the plant. However, according to the MoEF&CC report, most of the mercury-contaminated equipment and soil has been removed from the site.¹⁴²



Figure 9: Proportion of sector-wise estimated mercury emissions in India¹⁴³

¹³⁸ *Mercury in our Mouth*, TOXICSLINK, http://toxicslink.org/docs/Mercury_in_Our_Mouth.pdf (last visited May 30, 2020).

¹³⁹ Id.

¹⁴⁰ Dr. M.N.V. PRASAD, A STATE-OF-THE-ART REPORT ON BIOREMEDIATION, ITS APPLICATIONS TO CONTAMINATED SITES IN INDIA, (2011), http://soilhealth.ucdavis.edu/application/files/2015/4207/9078/BioremediationBook. pdf.

¹⁴¹ *Id.* at pg. 29.

¹⁴² Id.

¹⁴³ Implementation of the Minamata Convention to manage mercury pollution in India: challenges and

High-level exposure to mercury can harm the kidney, heart, lung, brain and immune systems of people of all ages.¹⁴⁴ High levels of methyl mercury in the bloodstream of unborn infants and young children may harm their developing nervous system.¹⁴⁵ In fact, mercury may have adverse effects on the nervous system, influencing the cognitive, neurological and motor functions.¹⁴⁶

TABLE – 13: Mercury by-product emissions from Anthropogenic sources in 2020 in India (In Kg) 147

Stationary Combustion	Non-ferrous metal production	Pig iron & crude steel production	Cement Large production scale gold production		Total (in kg)
208842.3	4330.3	1523.3	17124.0	124.8	231944.7

The Hazardous and Other Wastes (Management, Handling and Transboundary Movement) Rules, 2016, is the only rule in India that addresses a few aspects of mercury and how it is treated and handled in one way or another. In India, Delhi became the first state to switch from mercury to mercury-free equipment when Toxics Link released its first "Lurking Menace" research report in 2004.¹⁴⁸ In 2007, the Delhi Pollution Control Committee released a first-of-its-kind mercury phase-out order in Delhi that ordered all hospitals to switch from mercury to alternative devices.¹⁴⁹ In 2010, the Directorate-General for Health Services (DGHS) released a national guideline to mitigate environmental contamination caused by mercury and e-waste in central government hospitals and health centres.¹⁵⁰ In the same year, the Hubli-Dharwad Municipal Corporation (HDMC), Karnataka, also developed a

opportunities, Springer, https://enveurope.springeropen.com/articles/10.1186/s12302-019-0280-3/figures/1 (last visited May 30, 2020).

145 Stephan Bose-O'Reilly, *Mercury Exposure and Children's Health*, NCBI (May 17, 2010), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3096006/.

146 Id.

147 Mercury Free India, India Envrionment Portal (Sept. 29, 2014), http://www.indiaenvironmentportal. org.in/files/file/Mercury-Free-India.pdf

148 Darpan Singh, *Delhi hospitals phase out mercury*, HINDUSTAN TIMES (Dec. 04, 2012), https://www.hindustantimes.com/delhi-news/delhi-hospitals-phase-out-mercury/story-ED89WVKg1yDLrjeDvEv9WM.html.

149 *Bio-Medical Waste Management in Delhi*, DPCC, https://www.dpcc.delhigovt.nic.in/bio-medical-waste. html (last visited June 16, 2020).

150 MINISTRY OF HEALTH & FAMILY WELFARE, GUIDELINES FOR DISTRICT HOSPITALS (2012), https://nhm.gov.in/ images/pdf/guidelines/iphs/iphs-revised-guidlines-2012/district-hospital.pdf.



¹⁴⁴ Kevin M Rice, *Environmental Mercury and Its Toxic Effects*, NCBI (Mar. 31, 2014), https://www.ncbi. nlm.nih.gov/pmc/articles/PMC3988285/.

similar type of phase-out mercury for all HDMC hospitals.¹⁵¹ Similarly, Punjab and Manipur also issued phase-out mercury orders in the state health facilities in 2011 and 2012, respectively.¹⁵²

In 2012, the Central Pollution Control Board (CPCB) established guidelines for the ecologically friendly management of mercury and mercury-bearing waste from the healthcare sector.¹⁵³According to this guideline, mercury-bearing waste is produced as a result of accidental breakage of mercury-based instruments, obsolete mercury-containing medical devices (which are no longer in use) or mercurycontaminated items, including mercury spill and residual mercury base dental amalgam.¹⁵⁴ This guidance applies to the eco-friendly management of thermometers, sphygmomanometers, oesophageal dilators, dental amalgam, gastrointestinal tubes, feeding tubes, intraocular pressure devices, etc. which are used in any health care facility.¹⁵⁵ Despite these efforts made, there is still a long way to go before India is fully compliant with the obligations it has under the Minamata Convention.

CONCLUSION

Pharmaceutical waste tends to pose major treatment challenges largely due to the adoption of inaccurate or faulty approaches and inadequate methodologies as is revealed in quite a few reports. In the wake of these wrong approaches, reckless and indiscriminate flushing of millions of tons of unused drugs continues unabated which inevitably make their way through the municipal drainage systems. It leaves the possibility of BOD and hazardous COD loadings contributing to the increased rates of hazards. Although developing countries are considered to be potential pollution hotspots, Europe is the second largest source of pharmaceutical residues. Many of the pharmaceuticals discharged into water bodies are not readily destroyed and present a possible threat to the biosphere because their continual release renders them semi-persistent as has been evident from the findings of some

155 Id.

¹⁵¹ HUBLI-DHARWAD SUSTAINABLE HEALTHCARE WASTE MANAGEMENT PROJECT, REPORT KAP-SECOND, NOHARM, https://noharm.org/sites/default/files/lib/downloads/waste/Hubli-Dharwad_Waste_Mgmt_Project_Report_KAP2.pdf (last visited June 16, 2020).

¹⁵² *Ima Mercury Phase Out Policy,* IMA-INDIA, http://www.ima-india.org/ima/left-side-bar.php?pid=445 (last visited June 16, 2020).

¹⁵³ CENTRAL POLLUTION CONTROL BOARD, ENVIRONMENTALLY SOUND MANAGEMENT OF MERCURY WASTE IN HEALTH CARE FACILITIES (2010), https://cdn.cseindia.org/attachments/0.03944600_1499399128_Guidelines_For_ Mercury.pdf.

¹⁵⁴ Id.

researches.¹⁵⁶ Pharmaceuticals are highly dangerous environmental contaminants as even at incredibly low concentrations, they have the tendency to interfere with the biological processes.¹⁵⁷ Another big problem in efficient treatment has been the lack of administering treatment in stages according to the toxicity levels across each stage of treatment. It becomes a significant concern because the overall toxicity of pharmaceutical wastewater increases due to chemical reactions and mixing of substances that could have been segregated. Also, within the pharmaceutical industry, it is highly problematic when wastes from various segments are permitted to blend because wastes varying in physical and chemical characteristics interact with each other producing complex hybrid wastewater with properties that pose even greater difficulties in handling, analysis, isolation of components and overall treatment. Moreover, the unethical methods of disposing of domestic sewage, industrial effluents, and untreated medical wastes together in municipal wastewater management facilities exacerbate the problem.¹⁵⁸

There is a dearth of data on the different measures adopted for the treatment of pharmaceutical waste in the country. To obtain any ground data on how the pharmaceutical industries dispose of hazardous pharmaceutical waste, the national inventory on Hazardous Waste Generation and Management that is created by the Central Pollution Control Board must be examined and the amount of pharmaceutical hazardous waste that is generated from the pharmaceutical industry should be looked into. However, the national inventory provides generalised information about the number of hazardous waste generating units in each state, number of common and captive TSDFs in each state with incinerators and secured landfill. However, it does not provide segregated data on the amount of hazardous waste that is generated specifically from pharmaceutical industry. Similarly, for disposal of hazardous waste, though the inventory provides for the quantity of the hazardous waste disposed through incinerator, etc., it does not specify how much of the hazardous waste that is incinerated is from the pharmaceutical industry and how much from other industries. The annual reports provide statistics on the common biomedical waste treatment facilities and an overview of the management of BMW in the country. To efficiently

¹⁵⁶ C.G. Daughton & T. A. Ternes, *Pharmaceuticals and Personal Care Products in the Environment: Agents of Subtle Change*, ENV'L HEALTH PERS. 907 (1999).

¹⁵⁷ Gerard T. Ankley et al, *Repeating History: Pharmaceuticals in the Environment*, ENV'L Sci. Tech. 8211 (2007).

¹⁵⁸ Parimal Pal & Ritwik Thakur, *Pharmaceutical Waste Treatment and Disposal of Concentrated Rejects:* A Review, 4 INT'L J. ENG. TECH. SCI. Res. 130 (2017).

manage waste generated from the pharmaceutical sector, it is extremely important to have adequate data. This would enable identification of the measures presently being put to use and will facilitate formulation of more efficient strategies and plans to plug the loopholes in the existing measures and ensure better management of pharmaceutical waste.

It is important to further minimize the amount of pharmaceutical drugs entering the environment. This can be achieved by looking at issues such as prescription specification, package size, official disposal sites and the production of eco-friendly medicines. Such steps, which are also already being introduced at the point of entry into the environment, may also be complemented by additional technological end-of-pipe technical solutions. As these strategies are costly and need substantial investment, they are generally addressed only in developed countries. Initiatives to mitigate the influx of pharmaceuticals into the ecosystem include such steps as awareness campaigns on the disposal of pharmaceuticals, in addition to technological initiatives such as the expansion of wastewater treatment plants. The integration of pharmaceuticals into the environment as emerging policy issues canals open up crosssectoral and multi-stakeholder strategies in emerging and developing economies.

CHAPTER 13

LAWS REGULATING CHEMICALS USED IN COSMETICS AND FOOD INDUSTRY

INTRODUCTION

Advancements in the era of globalization and modernization have been on the rise. The unceasing desire for glamour and panache has resulted in the mushrooming of the Cosmetic Industry in India. While skin-care products are applied superficially on the skin, the law and policy behind cosmetics are deep and invasive, regulating its multifarious facets. Development of regulations for the cosmetic industry at the international and national level has been extensive. At the domestic front, steps have been taken towards making the cosmetics industry, a closely-regulated one, with requirements of separate registration and maintenance of standards at the stages of production, marketing and sales. On the international front, developments pertaining specifically to the cosmetic industry have been limited. However, inferences may be drawn from Conventions such as the Minamata Convention on Mercury. While Chapter 12 has intensively discussed the laws governing the pharmaceutical and drug sector in India, this chapter delves into the Indian regulations that govern the cosmetic and food industry.

DOMESTIC LEGAL INSTRUMENTS

Drugs and Cosmetics Act, 1940

The legislation that regulates the import, manufacture, distribution and sale of "cosmetics" at national level is the Drugs and Cosmetics Act, 1940. As per Section 3(aaa) of the Act, "cosmetic" means"any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to, the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance and includes any article intended for use as a component of cosmetic."

The procedure to be followed to manufacture cosmetics in India has been laid down under the Drugs and Cosmetics Rules, 1945.

Relevant Rules - These are certain prohibitions provided in the Rules -

- *Rule 129G* No cosmetic shall be imported unless it complies with the specifications prescribed under Schedule S and Schedule Q of the Rules, or any other applicable standards of quality and safety, and other provisions under the Rules. In case the cosmetic concerned is not included under Schedule S, it shall conform the specifications under the rules and standards applicable to it in the country of origin.
- *Rule 134* Prohibits the inclusion of dyes, colours and pigments other than those specified by the Bureau of Indian Standards (IS:4707 Part 1) and Schedule Q in cosmetics.
- Rule 134A Prohibits the import of cosmetics containing Hexachlorophene.
- *Rule 135* Prohibits the import of cosmetics in which a lead or arsenic compound has been used as a colourant.
- *Rule 135A* Prohibits the import of cosmetics containing mercury compounds.
- *Rule 144* Prohibits the manufacture of cosmetics containing colours other than those prescribed by Bureau of Indian Standards (IS: 4707 Part I) and Schedule Q.
- *Rule 144A* Prohibits the manufacture of cosmetic containing Hexachlorophene.
- *Rule 145* Prohibits the use of lead and arsenic compounds in cosmetics as colourants.
- *Rule 145D* Prohibits the manufacture of cosmetics containing mercury compounds.
- *Rule 146* Prohibits the sale or distribution of cosmetics unless the cosmetic concerned, if of Indian origin, is manufactured by a licensed manufacturer and labelled and packed in accordance with the Rules.
- *Rule 148A* Prohibits altering the inscription on containers, labels or wrappers of cosmetics.
- *Rule 148B* Prohibits false or misleading claims.
- *Rule 150-A-* Deals with the standards for cosmetics, which shall be such as prescribed in Schedule S.
Relevant Schedules - The following Schedules to the Rules are relevant for the production of cosmetic:

- i) Schedule M-II¹- Classifies cosmetics into 11 broad product categories.
- ii) *Schedule Q*²- Provides a comprehensive list of dyes, colours, and pigments which are permitted to be used in cosmetics and soaps under the Indian BIS Standards, i.e., IS 4707.
- iii) *Schedule S*³- States that cosmetics in the finished form shall conform to the standards laid down from time to time by the Bureau of Indian Standards (BIS).

Licensing and Registration Process

Chapter XIII of the Drug and Cosmetics Rules, 1945 makes provisions regarding the registration of cosmetics. The following licenses are required for the manufacturing and marketing of cosmetic products in India, according to the Drug and Cosmetics Act.

- The License under Form 32, issued for the manufacture or sale of cosmetics.
- The License under Form 32-A, issued for loans for the manufacture or sale of cosmetics.
- The License under Form 37, issued for the grant or renewal of approval for carrying out tests on drugs/cosmetics, or on the raw materials used in the manufacturing process.

All the cosmetic products that are imported into India for sale need to be registered with the licensing authority as defined under Rule 21(b) of Drugs and Cosmetics Rules, 1945.

Standards prescribed for Cosmetics

"IS 4707" has been specified by the Bureau of Indian Standards for cosmetics. The standard "IS 4707" for cosmetics have been classified further into 2 parts - a) IS 4707: Part 1 deals with the classification of cosmetic raw materials and adjuncts. It lists dyes, colours and pigments which are generally recognized as safe (GRAS) for use

¹ The Drugs and Cosmetics Act, 1940; Drugs and Cosmetics Rules, 1945.

² Drugs and Cosmetics Rules, 1945.

³ Id.

in cosmetics; b) IS 4707: Part 2⁴ also deals with the classification of cosmetic raw materials and adjuncts. It lists the raw materials that are generally not recognized as safe for use in cosmetics.

Standards for heavy metals in Cosmetics

The standard IS 6608:2004 provides that if all the raw materials have been tested for heavy metals and comply with the requirements, the manufacturer need not test the finished cosmetic for heavy metals and arsenic. Because of this regulatory loophole, the finished products are not tested, and heavy metals have consequently been found to be widespread in the cosmetics industry.

Schedule 'S'		
IS Number	Title	
IS 10284 : 1982	Specification for lip salve	
IS 10350 : 1999	Powder Hair Dyes (bi-lingual)	
IS 10998 : 1984	Specification for bindi (Liquid)	
IS 10999 : 1999	Kumkum powder - Specification (First Revision)	
IS 14137 : 1994	Cetyl alcohol for cosmetic industry - Specification	
IS 14318 : 1996	Liquid foundation make-up – Specification	
IS 14649 : 1999	Sindoor– Specification	
IS 15152 : 2002	Cold wax hair remover – Specification	
IS 15153 : 2002	Face pack – Specification	
IS 15154 : 2002	Kajal– Specification	
IS 15735 : 2006	Herbal cosmetics - General guidelines	
IS 9245 : 1994	Nail polish (Nail Enamel) - Specification (First Revision)	
IS 9740 : 2018	Shaving cream - Specification (First Revision)	
IS 15608 : 2018	Cream bleach - Specification (First Revision)	
IS 17117 : 2019	Hair shampoo for babies – Specification	

TABLE - 1: IS 4707: Part 2: 2017 has been referred to in following Indian Standards

Draft Rules on Cosmetics

The Health Ministry released the Draft Cosmetics Rules in 2018, to make cosmetic products safe. They were drafted to remove the lacunae in the existing Drugs and Cosmetics Act, and make manufacturers and importers more accountable for the safety and efficacy of the cosmetics being sold in the country.

⁴ *Indian Standards List,* BIS, https://www.services.bis.gov.in:8071/php/BIS/bisconnect/pow/is_details?IDS=MTEoNTQ%3D (last visited June 16, 2020).

Regulatory Authorities

Under the provisions of Drugs and Cosmetics Act, 1940 and the Rules made thereunder, the manufacture of cosmetics is regulated under a system of inspection and licensing by the State Licensing Authorities appointed by the respective State Governments, while the import of cosmetics is regulated under a system of registration by the Licensing Authority appointed by the Central Government. The Drugs Controller General (India) functions as the Licensing Authority which grants registration certificates and regulates the import of cosmetics into India, under the provisions of the Drugs and Cosmetics Act, 1940 and the Rules made thereunder.

The other important and relevant authorities that regulate the manufacturing, import and licensing of the chemicals are as follows -

- **The Drugs Technical Advisory Board** This Board is constituted under Section 5 of the Drugs and Cosmetics Act. It advises the Central Government and the State Governments on technical matters arising out of the administration of the said Act.
- **The Director of the Central Drugs Laboratory** They are appointed under Section 6.
- **The Drugs Consultative Committee** It is constituted under Section 7 of the Drugs and Cosmetics Act, to advise the Union Government, the State Governments, and the Drugs Technical Advisory Board on any other matter to secure uniformity in the administration of this Act.
- **Custom Commissioner** Their powers have been provided for under Section 11 of the Drugs and Cosmetics Act. The Commissioner can detain any cosmetic which is prohibited for import.
- **Inspector** Appointed under Section 21 by the Central or State government concerned.
- **Government Analysts** Appointed under Section 20 by State government concerned.
- **Drugs Controller and the Deputy Drugs Controller** appointed by the Central Government.
- Central Drugs Standard Control Organisation It has been established under the Directorate General of Health Services, Ministry of Health & Family Welfare. It is the Central Drug Authority for discharging the functions assigned to the Central Government under the D&C Act.

- National Accreditation Board for Testing & Calibration Laboratories (NABL)
- **Bureau of Indian Standards ("BIS")** The BIS is the apex body constituted under Section 3 of the Bureau of Indian Standards Act, 2016. It is responsible for the effective implementation of the standards laid down under the Act.

BANS BY THE MINISTRY OF HEALTH AND FAMILY WELFARE

The voluntary step taken by the Ministry of Health and Family Welfare to ban microbeads in cosmetics for reducing water pollution: The Ministry of Health and Family Welfare released a document on May 16, 2017, titled "*Classification for cosmetic raw materials and adjuncts, Part 2: List of raw materials generally not recognized as safe for use in cosmetics.*" The Document incorporates non-biodegradable polymeric microbeads in the banned list. This step can be viewed as one of the responsibilities of Indian Government under the United Nations Convention on the Law of the Sea, 1994 and the International Convention for the Safety of Life at Sea (SOLAS), 1974.

The Ministry of Health and Family Welfare banned testing on animals for the manufacture of cosmetics in 2014 vide a Gazette Notification.⁵ This measure added a new Rule 148-C to the existing Drugs and Cosmetics Rules, 1945, prescribing the prohibition of the testing of cosmetics on animals.

Adverse Effects of Chemicals used in the Cosmetic Industry

Schedule Q is one of the Schedules under the Drugs and Cosmetics Rules which describes the list of dyes, colours and pigments permitted to be used in cosmetics and soaps. **Schedule Q** further consists of two parts. **Part I** consists of 72 dyes, colours and pigments permitted to be used in cosmetics and soaps. **Part II** consists of 9 colours permitted to be used in soap. Unfortunately, despite the regulation of these chemicals, there is no guarantee that the products sold to consumers of the cosmetics industry will be protected from exposure to harmful substances. The IS 6608:2004 states that if all the raw materials have been tested for heavy metals and comply with the requirements, then the manufacturer need not test the finished cosmetic for heavy metals and arsenic. This regulatory loophole is probably why the finished products are not tested and heavy metals are found widespread in the cosmetics industry.

⁵ Ministry of Health and Family Welfare, G.S.R. 346 (E) (Notified on May 21, 2014).

In a January 2014, a study conducted by the Pollution Monitoring Lab (PML) at India's Centre for Science and Environment (CSE), alarming data regarding the unregulated use of toxic chemicals in cosmetic products were brought to light. 73 cosmetic products were tested from different categories to reveal excessive levels of hazardous heavy metals, including mercury, in half of the products tested.

- Mercury was found in 44% of the fairness creams tested by CSE, with concentrations in the range of 0.10 parts per million (ppm) to 1.97 ppm.
- Chromium was found in 50% of the lipsticks tested, in the range of 0.45 ppm to 17.83 ppm.
- Nickel was found in 43% of the lipsticks tested, in the range of 0.57 to 9.18 ppm. CSE did not find any heavy metals in anti-aging creams and lip balms. It also did not find lead and cadmium in lipsticks.⁶

Since there are no set limits for hazardous substances in the finished products or a specific government-run organisation ensuring the enforcement of existing regulations, despite the existing regulatory framework, the cosmetics industry in India remains weak and ineffective.

As far as dye related regulations are concerned, although the Drugs and Cosmetic Rules, 1945 states that the permitted synthetic organic colours and natural organic colours used in the cosmetic shall not contain more than 2 ppm of Arsenic calculated as Arsenic trioxide, 20 ppm of lead calculated as lead, 100 ppm of heavy metals other than lead calculated as the total of respective metals, there is no mention about the purity requirements of the colouring agents in the Act. This could be another problematic loophole which must be examined to avoid unnecessary adverse reactions to consumers of cosmetics.

Further, as in the case of drugs, adverse effects of cosmetics are also commonly encountered. In a retrospective study with 1609 participants, in a period of 5 years, 12.2% suffered from adverse effects of cosmetics and toiletries, out of which 63.3% were women and 36.7% were men. Most common complaint was itching (70.9%), dryness of skin (63.3%), and burning sensation in skin (50%).⁷

⁶ Unregulated and unlawful -Presence of heavy metals in cosmetics – a CSE study release, CENTRE FOR SCIENCE AND ENVIRONMENT, https://www.cseindia.org/unregulated-and-unlawful-5293 (last visited June 16, 2020).

⁷ Groot AC et al, *Adverse effects of cosmetics and toiletries: A retrospective study in the general population,* 9 INT'L J. COSMETIC SCI. 255 (1987).

INTERNATIONAL REGULATIONS

EU Regulations

The European Union has more stringent laws for cosmetics. Hence, a discussion on some of the fundamental provisions of these regulations is important and can serve as a good point of reference for the Indian regulators. The hazard-based, precautionary approach of the EU acknowledges that chemicals linked to cancer and birth defects simply do not belong to the category of cosmetics, regardless of the concentration of the chemical being used in the final product. The EU law bans 1,328 chemicals from use in cosmetics that are known or suspected to cause cancer, genetic mutation, reproductive harm, or birth defects. EU Regulation (EC) 1223/2009⁸ on cosmetic products is the primary regulatory framework for the finished cosmetic products placed on the EU market. It repeals the EU Cosmetics Directive (Directive 76/768/EC), which was adopted in 1976. The Regulation includes restrictions on the substances that may, or may not, be included in cosmetic products.

Article 10 under Chapter III of the Regulation, read with Annexure 1^o provides for safety assessments. Further, Article14 under Chapter IV, read with Annexure II, deals with restrictions on certain substances. Chapter IV of the Regulation provides for the restrictions on the use of certain substances in cosmetics. A list of banned substances is provided under Annexure II¹⁰ of the EU Cosmetics Regulation, and a list of restricted substances is mentioned in Annexure III. Further, a positive list of cosmetic ingredients is provided under Annexure IV, containing a list of approved colours. Annexure V contains the list of approved preservatives, and Annexure VI contains the list of approved UV filters.

Regulation (EC) no 1907/2006,¹¹ adopted by the European Parliament and Council in December 2006, deals with the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). The environmental concerns that are raised regarding the substances used in cosmetic products can be addressed through the application of this Regulation.

⁸ European Parliament and the Council on Cosmetic Products Regulation (EC) 1223/2009, 2009 O.J. (L 342/59).

⁹ Id. Annex I, 21.

¹⁰ *Id.* Annex II.

European Parliament and the Council on Cosmetic Products Regulation (EC) 1907/2006,2006 O.J. (L 136/3).

Regulatory Authorities

Some of the relevant authorities that govern the cosmetic sector in the European Union are the following:

- **European Chemicals Agency** it has been established under the REACH, as discussed hereinabove. It enables the assessment of environmental safety in a cross-sectoral manner.
- **European Commission** It is the executive branch of European Union. It implements all the regulations of the EU.
- **Standing Committee on Cosmetic Products** It assists the European Commission as per the procedure laid down under Article 32 of the EU Regulation on cosmetics.
- **Personal Care Product Council** –It manages the INCI, the naming convention discussed below.
- **The International Nomenclature Cosmetic Ingredient (INCI) system** -The INCIs are internationally recognized systematic names for the identification of cosmetic ingredients (i.e., plant extracts, oils, chemicals). They are developed by the International Nomenclature Committee (INC), and published in the International Cosmetic Ingredient Dictionary and Handbook. INCI names are primarily used for the labelling of finished cosmetic products.

CHEMICALS USED IN THE FOOD INDUSTRY IN INDIA

Packaged food products generally contain added substances, whether natural or artificial,¹² added to prolong their shelf lives or to retain their characteristics, etc. Food additives¹³ derived from natural or chemical compounds are added to packaged food substances to retain or enhance their colour, flavor, etc. Other substances such as colours are added to enhance their appeal. However, attention must be paid to the chemicals (artificial substance) added as their consumption along with the food is potentially harmful to human beings. Certain chemicals, if consumed beyond permissible limits, are harmful to human beings in the long run. Consequently, many national and international laws have been enacted to ensure regulate, and maintain standards regarding the quality of food, and to keep the same free from harmful chemicals.

¹³ Id. § 3(k).



¹² The Food Safety and Standards Act, 2006 § 3(zw).

Domestic Legal Instruments

To regulate the evolving food industry and maintain food standards on par with international standards, the following domestic laws have been enacted:

The Food Safety and Standards Act, 2006

It is the principal Act to regulate food safety in India. Prior to the FSSA, the Prevention of Food Adulteration Act, 1954 ("the PFA") regulated food safety in India for several decades. The PFA witnessed several Orders being issued under different Government Ministries to regulate different types of food, such as for milk and milk products Orders, etc. However, it proved insufficient to harmonize the standards in the food industry with the international standards. Subsequently, the FSSA was enacted, repealing¹⁴ the PFA and consolidating the various laws pertaining to food safety, with one apex regulatory authority known as the Food Safety and Standards Authority of India ("FSSAI") being constituted under Ministry of Health and Family Welfare.

Thus, the FSSA is the mandatory law laying down the minimum quality standards to be followed by the food industry, to ensure food safety in the face of the addition of food additives, impurities, etc.¹⁵ Non-compliance with the provisions of FSSA attracts penal provisions under the same, with punishments being prescribed in terms of fine and imprisonment.¹⁶

The Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011

The FSSAI, in exercise of the powers conferred by clause (e) of sub section (2) of Section 92 read with Section 16 of FSSA, proposed the Food Safety and Standards (Food Products Standards and Food Additives) Regulations. The Regulations were officially published in the Gazette of India in 2010, and came into effect in 2011. They prescribe the minimum standards¹⁷for food safety, and the additives that can be added to food. Chapter 3 of the Regulations specifically deals with substances added to food. The various substances that may be added are enumerated below:

¹⁴ Id. Sch. II.

¹⁵ Id. §§ 16, 22 & 26.

¹⁶ *Id.* §§ 33, 34, 39, 59-64 & 66.

¹⁷ Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2010, Reg. 3.2.

- i. **Food Additives:** Food Additives are permitted as long as added in conformity with the limits prescribed in the Regulations or in Appendix A, or in the Good Manufacturing Practices (GMP) for the use of food additives. Hence, the food additives may be used under the following conditions:
 - (i) The quantity of the additive should be limited to the lowest possible level necessary to accomplish the desired effect;
 - (ii) The person concerned must reduce, to the extent possible, the quantity of the additive becoming a component of the food as a result of its uses in the manufacturing, processing or packaging processes, where the additive is not intended to accomplish any physical or other technical effect on the food itself; and
 - (iii) The additive must be prepared and handled in the same way as a food ingredient. $^{\scriptscriptstyle 18}$

Thus, only the permissible food additives satisfying the above conditions can be added to specific food products including cream,¹⁹ cheese,²⁰ dairy based confectioners or deserts,²¹ evaporated or condensed milk and milk products,²² milk cereals,²³ butter or ghee or milk fats,²⁴ and sugar.²⁵ However, food additives are prohibited in foods for infant nutrition such as infant milk,²⁶ but permitted in infant formula.²⁷ The food additives permitted in 100ml of Infant formula include pH - adjusting agents, sodium hydroxide, sodium hydrogen carbonate, the same being limited by good sodium carbonate manufacturing practices and within the limits prescribed for Sodium and Potassium Hydroxide in all types of infant formulae. Other additives, such as sodium citrate potassium citrate and limited by good formulae manufacturing practices in all types of infant formulae, etc.²⁸

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18 Id. Reg. 3.1.
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19 Id. Reg. 2.1.6(2).
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- 20 Id. Reg. 2.1.6(11).
- 21 Id. Reg. 2.1.7(11).
- 22 Id. Reg. 2.1.8(11).
- 23 Id. Reg. 2.1.9(3).
- 24 Id. Reg. 2.1.10(11).
- 25 Id. Reg. 2.1.8(11).
- 26 Id. Reg. 2.1.9(11).
- 27 Id. Reg. 2.1.9(2).
- 28 Id. Reg. 2.1.9(2).

- ii. **Colouring Matter:**²⁹ Any unauthorized addition of colouring matter to food products is prohibited unless permitted under the Regulations. The rule applies to synthetic colours, inorganic colours, etc.
- iii. **Artificial Sweeteners:**³⁰ Only artificial sweeteners specified under the Regulations can be used in the specified foods in the permissible quantity. For instance, Saccharin Sodium can be used in carbonated water to a maximum permissible limit of 100 ppm. However, no mixture of artificial sweeteners is permitted to be added to any article of food, or in the manufacture of table top sweeteners.³¹
- iv. **Preservatives:**³² Class II preservatives, such as Benzoic acids and its salts, Nissin, etc., are restricted as prescribed in the Regulations. Using more than one Class II preservative is prohibited.
- v. **Antioxidants:**³³ The use of antioxidants in food articles is prohibited unless used as prescribed under the Regulations and within the permissible limits. No limitation applies to the use of lecithin, ascorbic acid and tocopherol as antioxidants in food substances.
- vi. **Emulsifying and Stabilising agents:**³⁴ Unless specifically permitted under the Regulations and Appendix A, no emulsifiers or stabilising agents such as agar, gelatine etc., can be used in food substances.
- vii. **Anticaking Agents:**³⁵ No anticaking agents can be used in any food except where the use of anticaking agents is specifically permitted under the Regulations.
- viii. **Antifoaming agents in edible oils and fats:**³⁶ The Regulation permits the use of Dimethyl Polysiloxane (food grade), to be used as an antifoaming agent in edible oils and fats for deep fat frying upto a maximum limit of 10 ppm. Similarly, mono and diglycerides of fatty acids of edible oil may be used as antifoaming agents in jam, jellies and marmalade.

- 30 Id. Reg. 3.1.3(1).
- 31 Id. Reg. 3.1.3(2).
- 32 Id. Reg. 3.1.4(2).
- 33 Id. Reg. 3.1.5.
- 34 Id. Reg. 3.1.6.
- 35 Id. Reg. 3.1.7.
- 36 Id. Reg. 3.1.8.

²⁹ Id. Reg. 3.1.2(2).

- ix. **Use of release agents in confectionery:**³⁷ Spreadasil silicon spray (Dimethyl Polysiloxane), in quantities not exceeding 10ppm of the finished product, can be used as a release agent in confectionery.
- x. Flavouring Agents and Related Substances:³⁸ Flavouring agents that may contain anticacking agents, antifoaming agents and antioxidants can be used within the permitted levels. However, the Regulation expressly prohibits the use of certain flavouring agents, such as β -asarone and cinamylanthracilate, from use in any article of food.
- xi. **Use of Flavour Enhancers:**³⁹ Monosodium Glutamate can be used as per the Regulations; however, it is prohibited from use in food for infants below twelve months of age, and in other foods such as fresh fruits, frozen vegetables, and chocolate.
- xii. Sequestering and Buffering Agents (Acids, Bases, and Salts):⁴⁰ Permitted sequestering and buffering agents can be used only as prescribed in the Regulations.

The Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011

The Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011 regulate the permissible limits of contaminants in substances including crops, whether intentional or otherwise. The chemicals described in the monographs of the Indian Pharmacopoeia, or mentioned under Chapter 2 of the Contaminants Regulations, are permitted to be used in foods within the permissible limits. Similar restrictions are placed on toxic and other substances, including residue from insecticides and antibiotics.

The Food Safety and Standards (Prohibition and Restrictions on Sales) Regulations, 2011

The Regulations prohibit the sale of any food article containing any substance, including a food additive, beyond the specified limits, or the sale of prohibited

39 Id. Reg. 3.1.11.

³⁷ *Id.* Reg. 3.1.9.

³⁸ Id. Reg. 3.1.10.

⁴⁰ Id. Reg. 3.1.12.

substances or substances not specified under the FSSA and Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011.

The Food Safety and Standards (Laboratory and Sample Analysis) Regulations, 2011

The Regulations establish notified laboratories and referral laboratories in India, and prescribe the procedure for sample analysis to detect the presence of substances either prohibited or in excess of the permissible limits prescribed under the FSSA and the Regulations thereunder.

The Narcotic Drugs and Psychotropic Substances Act, 1985

The FSSA specifically prohibits the manufacture, distribution, sale or import of any food item for special dietary uses, of functional food, of nutraceuticals (food, or parts that provide medical or health benefits, including the prevention and treatment of disease), and of health supplements,⁴¹ if the same includes a narcotic drug or a psychotropic substance as defined in the Schedule of the Narcotic Drugs and Psychotropic Substances Act, 1985 and the Rules made thereunder.⁴²

The Drugs and Cosmetics Rules, 1945

The FSSA prohibits the manufacture, distribution, sale or import of any foods for special dietary uses, of functional foods, of nutraceuticals, and of health supplements,⁴³ if the same includes a narcotic drug or a psychotropic substance as defined and listed in Schedules E and EI of the Drugs and Cosmetics Rules, 1945.

The Bureau of Indian Standards Act, 2016

The Act establishes Bureau of Indian Standards, a national standards body for promoting safety, maintaining the quality of products, providing certifications of quality, establishing standard marks,⁴⁴ and performing other functions enumerated in the Act.⁴⁵

⁴¹ $\,$ The Food Safety and Standards Act, 2006, § 22.

⁴² Id. § 22(b)(iv).

⁴³ *Id.* § 22.

⁴⁴ The Bureau of Indian Standards Act, 2016, § 12.

⁴⁵ *Id.* § 9.

Relevant International Instruments

Codex Alimentarius-International Food Standards

India became a member of Codex Alimentarius in 1964. The Codex Alimentarius is a collection of internationally adopted food standards and related texts, with an aim to protect consumers' health and ensure fair practices in food trade.⁴⁶ The publication of the Codex Alimentarius is intended to guide and promote the elaboration and establishment of definitions and requirements for foods to assist in their harmonization and in doing so, to facilitate international trade.⁴⁷ It includes provisions in respect of food hygiene, food additives, residues of pesticides and veterinary drugs, contaminants, labelling and presentation, methods of analysis and sampling, and import and export inspection and certification.⁴⁸ The Codex standard can be general or specific to a commodity. The Code of Practice Concerning Source Directed Measures to Reduce Contamination of Food with Chemicals,⁴⁹ Code of Practice for the Prevention and Reduction of Arsenic Contamination in Rice, Code of Practice for the Prevention and Reduction of Mycotoxins in Spices, Code of Practice for the Reduction of 3-Monochloropropane-1, 2-Diol Esters (3-MCPDEs) and Glycidyl Esters (GEs) in Refined Oils and Food Products Made With Refined Oils, Guidelines for Rapid Risk Analysis Following Instances of Detection of Contaminants in Food where there is No Regulatory Level, General Standard for Contaminants and Toxins in Food and Feed, General Methods of Analysis for Contaminants⁵⁰ all deal with environmental chemicals and other harmful chemicals used as food additives etc., which may contaminate foods and constitute health hazard to humans.

UNEP International Register of Potentially Toxic Chemical Regulations and Guidelines on Chemicals ("IRPTC")

The UNEP established the IRPTC in 1976, on the recommendations of the United Nations Conference on the Human Environment (Stockholm) in 1972. The aim of the

48 Id.

⁴⁶ *About Codex Alimentarius*, FOOD AND AGRICULTURAL ORGANISATION OF UNITED NATIONS, http://www.fao.org/fao-who-codexalimentarius/about-codex/en/#c453333 (last visited May 28, 2020).

⁴⁷ Id.

⁴⁹ FOOD AND AGRICULTURAL ORGANISATION, CODE OF PRACTICE CONCERNING SOURCE DIRECTED MEASURES TO REDUCE CONTAMINATION OF FOOD WITH CHEMICALSCAC/RCP 49-2001 (2001), http://www.fao.org/fao-whocodexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites% 252Fcodex%252FStandards%252FCXC%2B49-2001%252FCXP_049e.pdf.

⁵⁰ *Contaminants*, FOOD AND AGRICULTURAL ORGANISATION, http://www.fao.org/fao-who-codexalimentarius/ thematic-areas/contaminants/en/#c452833 (last visited May 28, 2020).

IRPTC is to provide adequate information on chemicals posing a hazard for human health and the environment.

World Health Organisation ("WHO") - SPS Agreement

Sanitary and phyto-sanitary measures have been suggested by the WHO for the international trade of food products, and to secure the safety of human, animal and plant health and life. This Agreement provides the minimum standards that a member country must maintain. These measures deal typically with additives, contaminants, poisonous substances, etc., in food or drinks.

The UNEP Guidelines for the Exchange of Information on Chemicals in International Trade (1989)

The Guidelines regulate the exchange of information on Chemicals in International Trade which are harmful to human beings and the environment through the establishment of designated national authorities. However, food additives have been exempted from the purview of the Guidelines, and discretion is vested with member States to adopt these guidelines for food additives.⁵¹

REGULATORY AUTHORITIES: DOMESTIC & INTERNATIONAL

In the International sphere, the Joint FAO/WHO Expert Committee on Food Additives is an international scientific expert committee established jointly by the Food and Agriculture Organisation of the United Nations (FAO) and WHO, to evaluate the safety of food additives, contaminants, naturally occurring toxicants and residues of veterinary drugs in food. Moreover, the Codex Alimentarius Commission of the Food and Agriculture Organisation of the United Nations is the body responsible for the implementation of the Joint FAO/WHO Food Standards Programme. It was established in 1963 by the FAO and the World Health Organisation to develop harmonised international food standards.

Further, the Codex Committee on Contaminants in Food establishes and prescribes the permissible maximum levels for contaminants and naturally occurring toxicants in food and feed. The Committee's objectives include, *inter alia*, preparing priority lists of contaminants and naturally occurring toxicants for risk assessment by the Joint FAO/WHO Expert Committee on Food Additives, and prescribing methods of

⁵¹ United Nations, Environment Program, NEP Guidelines for the Exchange of Information on Chemicals in International Trade (1989) ¶ 3.

analysis and sampling for the determination of contaminants and naturally occurring toxicants in food and feed.⁵²

Moreover, the International Organisation for Standardisation Technical Committee created in 1947, lays down the standards related to food and food safety. It is one of the ISO's oldest and most prolific committees, and establishes standards which ensure the food is free from substances hazardous to human health. It covers a vast range of food products, such as milk, meat, spices to vitamins and more.

In India, the Food Safety and Standards Act establishes⁵³ the Food Safety and Standards Authority of India under the aegis of the Ministry of Health and Family Welfare, to lay down science-based standards for food articles, to regulate their manufacture, storage, distribution, sale and import, to ensure the availability of safe and wholesome food for human consumption and, for matters connected therewith or incidental thereto.⁵⁴ The FSSA also creates a hierarchy of authorities with the powers necessary to implement the provisions of the Act, Rules and Regulations framed thereunder. The FSSAI, the autonomous apex statutory authority, is responsible for all matters related to food safety and standards under the FSSA. Its role can primarily be classified into setting food standards and ensuring compliance and inspections. In establishing food standards, it is aided by the Scientific Committee⁵⁵ along with scientific panels.⁵⁶ In compliance and inspections, it is aided by the Central Advisory Committee.⁵⁷ The Food Authority and the State Food Safety Authorities shall be responsible for the enforcement of this Act.58 The State Government appoints a Commissioner of Food Safety in each state for the effective implementation of the Act.⁵⁹ The Commissioner of Food Safety appoints a Designated Officer, who shall not be below the rank of a Sub-Divisional Officer, to be in charge of food safety administration in each district.⁶⁰

- 56 *Id.* § 13.
- 57 Id. § 11.
- 58 Id. § 29.
- 59 *Id.* § 30.
- 60 *Id*.§ 36.

⁵² *Codex Committee on Contaminants in Food*, Food and Agricultural Organisation (May 29, 2020), http://www.fao.org/fao-who-codexalimentarius/committees/committee/en/?committee=CCCF.

⁵³ The Food Safety and Standards Act, 2006, § 4.

⁵⁴ Id. Statement of Objects and Reasons.

⁵⁵ Id. § 14.

The Commissioner further appoints a food safety officer⁶¹ and food analyst⁶² in the local areas.



Figure 1: Organisational Structure of FSSAI

The Bureau of Indian Standards is the Apex body constituted under the Bureau of Indian Standards Act, 2016.⁶³ The members of Governing Council constitute the Bureau, and the Director General⁶⁴ is the Chief Executive Officer. The Bureau is responsible for the effective implementation of the Act.

BANS PASSED BY GOVERNMENT

The FSSAI, in 2015, banned Maggi noodles, a food product of Nestlé, on grounds of the presence of lead beyond the permissible limit.⁶⁵ In 2016, it recommended the ban on the use of potassium bromated and potassium iodate in breads, pursuant to a study by the Centre for Science and Environment (CSE) describing the chemical as carcinogenic.⁶⁶ Again, in 2016, the use of silver leaf in sweets, etc., was banned as the same contained buffalo skin and trace metals.⁶⁷ Further, in 2018, the FSSAI banned

⁶¹ Id.§ 37.

⁶² *Id*.§ 45.

⁶³ The Bureau of Indian Standards Act, 2016 § 3.

⁶⁴ Id. § 7.

⁶⁵ *FSSAI orders recall of all 9 variants of Maggi noodles from India*, FIRSTPOST (June 5, 2015), https://www.firstpost.com/business/fssai-orders-recall-of-all-9-variants-of-maggi-noodles-from-india-2281400. html.

⁶⁶ India bans use of cancer-causing additive, potassium bromate, in bread, other food, The TIMES OF INDIA (June 21, 2016), https://timesofindia.indiatimes.com/india/India-bans-use-of-cancer-causing-additive-potassium-bromate-in-bread-other-food/articleshow/52836892.cms.

⁶⁷ Sushmi Dey, *FSSAI bans silver leaf of animal origin in food items*, THE TIMES OF INDIA (Aug. 3, 2016), https://timesofindia.indiatimes.com/india/FSSAI-bans-silver-leaf-of-animal-origin-in-food-items/ articleshow/53514713.cms.

the use of recycled plastics, newspapers, and magazine papers as packaging materials for food, as the same contain hazardous chemicals.⁶⁸ In 2019, it directed all Food Safety Commissioners to scale up surveillance and enforcement activities to prevent the use of calcium carbide or acetylene gas in artificially ripening fruits.⁶⁹ In 2018, the BIS banned the use of toluene, titanium acetylacetonate and phthalates in the printing of packaging materials used for food products, due to their harmful effects on human health.⁷⁰

CONCLUSION

It is pertinent to note that the Food Industry has been regulated strictly, with pertinent bans on food articles as and when the cause of suspicion arises as to use of carcinogenic substances in the preparation of the same. As mentioned in this Chapter, it is no secret that there are major loopholes in the chemical regulation of cosmetic products. Further, there are various authorities and guidelines within which these regulatory processes function. These variations result in inconsistencies between cosmetics manufacturers and make the process of implementation and enforcement of existing regulations, a time consuming and complex endeavour. The Indian cosmetic industry is in dire need of either a uniform and single regulatory system, or the harmonisation and simplification of existing regulations, for the purpose of improving the quality and safety of products among other factors. This action would ultimately serve as a safeguard for cosmetic product consumers in India.

⁶⁸ FSSAI Bans Use of Recycled Plastic or Newspaper for Packaging of Food Items From July 1, 2019, The Food Safety and Standards Authority of India (Dec. 29, 2018), https://www.fssai.gov.in/upload/media/ FSSAI_News_BanPlastic_Latest_31_12_2018.pdf.

⁶⁹ Abha Toppo, FSSAI Directs Food Commissioners to Prevent Use of Banned Substances for Artificial Ripening of Fruits, The Food Safety and Standards Authority of India (Mar. 26, 2019), https://www.fssai.gov.in/upload/media/FSSAI_News_Banned_Krishi_27_03_2019.pdf.

⁷⁰ Sounak Mitra, *BIS bans use of toluene in printing food packets*, LIVEMINT (July 30, 2018), https://www.livemint.com/Politics/P3T67loZlafkPsEb3uPKgI/BIS-bans-use-of-toluene-in-printing-food-packets. html.

CHAPTER 14

LAWS REGULATING THE AGROCHEMICAL SECTOR IN INDIA

INTRODUCTION

The Indian agrochemical industry is the fourth largest agrochemicals producer in the world. The scope of agrochemicals in India includes insecticides, fungicides, fumigants, herbicides, bio- pesticides, plant growth regulators, organic and inorganic fertilizers, nematicides, and rodenticides.¹ The Ministry of Agriculture and Farmers' Welfare and the Ministry of Chemicals and Fertilizers are empowered to regulate agrochemicals in India.² However, the role of the Ministry of Commerce and Industry can also be witnessed, in the regulation of the import and export of agrochemicals.

The traditional methods of farming and agriculture in India are heavily dependent on the monsoon season. However, the growing need for increased production in the face of increasing food demand due to increasing population, a phenomenon also recognized by the UN Food and Agriculture Organisation, lays the groundwork for dependence on agrochemicals for crop protection as well as enhanced production.³ Factors such as a reduction in the total arable land, coupled with growing awareness regarding agrochemicals, especially insecticides, among farmers, have led to the strengthening of the agrochemicals market in India. The Indian pesticides market was worth ₹ 197 Billion in 2018. The market is further projected to reach a value of ₹ 316 Billion by 2024, growing at a CAGR of 8.1% during 2019-2024.⁴

¹ *Indian Agrochemical Industry*, FICCI, http://ficci.in/events/20563/Add_docs/SectorBrief.pdf (last visited May 30, 2020).

² Role of Agrochemicals in Sustainable Farming, A Report on Indian Agrochemical Industry, FICCI, http://ficci.in/spdocument/23103/agrochemical-ficci.pdf (last visited May 30, 2020).

³ USHERING IN THE 2ND GREEN REVOLUTION: ROLE OF CROP PROTECTION CHEMICALS: A REPORT ON INDIAN AGROCHEMICAL INDUSTRY (2015).

⁴ Report on Indian Pesticides Market: Industry Trend, Share, Size, Growth, Opportunity and Forecast 2019-2024, RESEARCH AND MARKETS, https://www.researchandmarkets.com/reports/4763056/indian-pesticides-market-industry-trends-share?w=4 (last visited May 30, 2020).

In 2018-19, Government statistics showed that the production of key agrochemicals in India was at 2,16,703 Metric Tonnes (Tech Grade), as opposed to 1, 86, 460 Metric Tonnes in 2015-16.⁵ The total amount of chemical fertilizers produced in India during the 2017-18 period was 273.18 lakh Metric Tonnes by the private sector and 462.20 lakh Metric Tonnes by the public sector.⁶

The amount of pesticides and insecticides exported during 2017-18 was 3,58,481 Metric Tonnes, and the amount of inorganic chemicals including chemical fertilizers exported was 1,73,071 Metric Tonnes.⁷ The amount of pesticides and insecticides imported during 2017-18 was 44,145 Metric Tonnes, and the amount of inorganic chemicals including chemical fertilizers imported was 12,28,854 Metric Tonnes.⁸





This Chapter discusses all the Indian laws and international instruments that regulate the production, distribution, sale, use, labelling, packaging, transportation, storage, import, export, handling and disposal of agrochemicals in India.

⁵ *Production of Key Pesticides During 2014-15 to 2018-19*, DIRECTORATE OF PLANT PROTECTION, http://ppqs. gov.in/statistical-database (last visited May 30, 2020).

⁶ ANNUAL REPORT 2017-18, DEPARTMENT OF FERTILISERS, GOVERNMENT OF INDIA(2018), http://fert.nic.in/sites/default/files/Annual_Report_2017-2018.PDF.

⁷ *Chemical and Petrochemical Statistics at a Glance-2018*, GOVERNMENT OF INDIA, https://chemicals.nic.in/ sites/default/files/Chemical%20and%20Petrochemical%20Statistics%20at%20a%20glance%20_2018. pdf (last visited May 30, 2020).

⁸ Id.

⁹ Production of Key Pesticides, supra note 5.

REGULATORY FRAMEWORK FOR AGROCHEMICALS IN INDIA

The initial efforts for developing a regime for agrochemicals were made as early as the 1950s, in the wake of the growing number of deaths in certain parts of the country from poisoning through the consumption of certain imported insecticides and pesticides. Eventually, such efforts culminated in the formation of the Expert Committee of the Indian Council of Agricultural Research (ICAR), headed by Prof. M. S. Thacker. The recommendations of the Expert Committee laid the groundwork for the comprehensive legislation called the Insecticides Act.¹⁰

The Insecticides Act, 1968 was the first of such legislations, and is also one of the leading legislations relating to agrochemicals in India. It *inter alia*, regulates the manufacture, distribution, sale and use of insecticides in India to minimize risk to human beings and animals, and deals with related matters.¹¹ It is an umbrella legislation that governs insecticides and pesticides in India¹² along with the Insecticides Rules, 1971 and the Pesticides (Prohibition) Order, 2018. The Insecticides Rules, 1971 have been prescribed by the Central Government in consultation with the Central Insecticides Board, in exercise of powers granted under Section 36 of the Insecticides Act, 1968.¹³ Further, over the course of the operation of the Act, various Notifications that have been issued. Moreover, the Notifications have also enlarged the scope of the Schedule appended to the Act.

Existing legislations and policies pertaining to agrochemicals in India can be classified into two categories. *Firstly*, legislations and polices exclusively dealing with certain kinds of agrochemicals, and processes and activities associated with them; *secondly*, those which contain provisions that help enhance the framework surrounding agrochemicals in India. The Insecticides Act would fall in the former category. The exiting legislations and policies that combine to create the regulatory framework for agrochemicals in India are-

- Industries (Development and Regulation) Act, 1951
- Insecticides Act, 1968

¹⁰ About CIBRC, Directorate of Plant Protection, Quarantine and Storage, Ministry of Agriculture and Farmers' Welfare, http://ppqs.gov.in/divisions/cib-rc/about-cibrc (last visited May 30, 2020).

¹¹ The Insecticides Act, 1968.

¹² *Id*.

¹³ Insecticides Rules 1971.

- Insecticides Rules, 1971
- Fertilizer (Movement Control) Order, 1973
- Fertilizer (Control) Order, 1985
- Manufacture, Storage and Import of Hazardous Chemical Rule, 1989
- Public Liability Insurance Act, 1991
- Food Safety and Standards Act, 2006
- Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016
- ITC (HC) Import Policy, 2017
- ITC (HS) Export Policy, 2018
- Pesticides (Prohibition) Order, 2018

Apart from the above mentioned laws, there are also various international instruments that deal with the issues in hand. The next portion of the Chapter explains the various legal obligations and the legal framework for the regulation of different processes and activities associated with agrochemicals.

MANUFACTURE AND PRODUCTION

The production of agrochemicals would essentially refer to the process of the development and manufacture of agrochemicals. The Industries (Development and Regulation) Act, 1951 has been enacted for the orderly development and regulation of certain industries.¹⁴ The First Schedule appended to the Act, which was introduced by the Industries (Development and Regulation) (Amendment) Act, 1956,¹⁵ specifies the list of industries which are regulated by the Act. The Act applies to the production or manufacture of-

- 1. Fertilizers, such as inorganic and mixed fertilizers.
- 2. Chemicals other than fertilizers, such as insecticides, weedicides, fungicides and the like.

¹⁴ The Industries (Development and Regulation) Act, 1951.

¹⁵ The Industries (Development and Regulation) (Amendment) Act, 1956.

THE REGULATION OF THE AGROCHEMICAL INDUSTRY UNDER THE INDUSTRIES ACT, 1951

Section 5 of the Act establishes a Central Advisory Council, which must have members capable of representing the interests of owners, persons employed, consumers, and other classes of persons related with the scheduled industries, which includes industries that manufacture or produce agrochemicals such as fertilizers, insecticides, weedicides and the like.

Section 9 of the Act provides the conditions under which cess can be imposed on scheduled industries. Section 10 provides provisions for the registration of industrial undertakings, and Section 11A prescribes provisions for licensing for production and manufacturing. Section 12 provides provisions for the revocation and amendment of licenses. Section 15 empowers the Central Government to investigate scheduled industries if the volume of production falls substantially, a deterioration in quality of the articles produced takes place, there exists a rise in price of any article, or if management of any scheduled industry is detrimental to public interest.

Section 18A empowers the Central Government to assume the control and management of a scheduled industrial undertaking if such an industry fails to comply with the directions issued to it, or if investigation is conducted and it is found that the operation of such industry is detrimental to public interest. Section 18G of the Act empowers the Central Government to control and regulate the supply and distribution of any article of a scheduled industry. The contravention of these provisions attracts penalties under Section 24, of imprisonment upto 6 months or fine upto ₹ 5,000, or both. In the case of continuing offences, a fine upto ₹ 500 per day can be imposed under the Act.

THE MANUFACTURING OF INSECTICIDES AND REGULATION UNDER THE INSECTICIDES ACT

With respect to insecticides, Section 3(e) of the Insecticides Act defines "manufacture" as a process or part of a process for making, altering, packing, labelling, finishing, treating, breaking up or adopting any insecticide, in order to enable it for sale, distribution or use. However, the definition specifically excludes the packing and breaking up of insecticides when conducted as a separate retail business. Chapter 7 has dealt with the Insecticides Act and Insecticides Rules in some detail while discussing

the Indian laws that implement the principles of the Rotterdam Convention. In this Chapter only those provisions that have not been previously discussed in Chapter 7 would be delineated.

The Central Insecticide Board and Registration Committee

As per Rule 3 of the Insecticides Rules, 1971,¹⁶ the manufacture of insecticides would be subject to the following determinations and functions of the Central Insecticides Board and Registration Committee established under Sections 4 and 5 of the Act respectively:

- Advising the Central Government on the manufacture of insecticides under the Industries (Development and Regulation) Act, 1951.
- Specifying the uses of different classes of insecticides on the basis of their toxicity, and mentioning their suitability for aerial application.
- Providing advice regarding the tolerance limits for insecticide residues and stipulations of minimum intervals between the application of insecticides and harvest in respect of various commodities.
- Specifying the shelf-life of insecticides.
- Suggesting colourisation, including the colouring matter which may be mixed with concentrates of insecticides, particularly those of a highly toxic nature.
- Carrying out such other functions as are supplemental, incidental or consequential to any of the functions conferred by the Act or the Rules.

Registration and Licensing

As per the Insecticides Rules, if the registration of an insecticide for manufacture, use, sale or distribution is refused or cancelled under the 1968 Act, the decision has to be published in two English and Hindi newspapers which are circulated in most parts of India, and in the journals published by the Department of Agriculture, Government of India.¹⁷ A license for insecticide manufacturing has to be issued under Form V, and various conditions can be attached to such grant of license. Such conditions require that the license and/or renewal certificate has to be maintained in the approved

¹⁶ See also Central Insecticides Board, http://ppqs.gov.in/central-insecticides-board (last visited May 30, 2020).

¹⁷ Insecticides Rules, 1971, Rule 8.

premises, and has to be furnished to the Insecticide Inspector on request. If the license holder requires additional insecticides to be added to the license, they can apply to the respective licensing officer for the same. A list of insecticides or pesticides so registered under Section 9(3) is duly recorded and updated on the website of the Directorate of Plant Protection, Quarantine and Storage, Ministry of Agriculture and Farmers' Welfare. The website also makes records of banned substances publicly available.¹⁸ Furthermore, the Committee also specifies the precautions to be taken against any poisoning or handling of such substances.¹⁹

Restrictions on the Manufacturing of Insecticides

Section 17 of the Act prohibits the manufacture of misbranded insecticides, or insecticides that have been prohibited temporarily under Section 27 of the Act, or those that are restricted under the Act or Rules, or those whose manufacture has not been permitted by the licensing officer or the Registration Committee, and the manufacture of such insecticides would lead to contravention of the Act and Rules. There are also some exemptions from the application of the Act: in so far as the manufacture, use, distribution or sale of insecticides not for repelling, destroying, or mitigating any fungi, weed, insects, rodents or other forms of plant or animal life that is not useful for human beings, the same are not regulated under the Act.²⁰

Manufacture of Fertilizer Mixtures

The framework for fertilizers, as opposed to insecticides, is laid down by the Fertilizer (Control) Order, 1985. It was enacted vide Notification No. G.S.R. 758(E) by the Central Government, under the powers conferred under Section 3 of the Essential Commodities Act, 1955.²¹ Regulation 2(g) defines the term "fertilizer" as a substance which is used as fertilizer in soil or crops, which is enlisted under Part A of Schedule I, and includes a mixture of provisional fertilizers, customized fertilizers and biofertilizers that are listed under Schedule III, or organic fertilizers listed under Schedule IV.

¹⁸ Registered Products, DIRECTORATE OF PLANT PROTECTION, QUARANTINE AND STORAGE, MINISTRY OF AGRICULTURE AND FARMERS' WELFARE, http://ppqs.gov.in/divisions/cib-rc/registered-products (last visited May 30, 2020).

¹⁹ Insecticides Rules, 1971, Rule 4.

²⁰ The Insecticides Act, 1968, § 38.

²¹ Ministry of Agriculture and Rural Development, Fertiliser (Control) Order, 1985, G.S.R. 758 (E) (Notified on Sept. 25, 1985) [hereinafter Fertiliser (Control) Order, 1985]

Regulation 13 provides that the manufacture of mixed fertilizers is prohibited, unless they conform to the standards specified under the Order. Regulation 14 mandates that every person who wishes to undertake the manufacture of mixed fertilizers has to obtain a certificate of manufacture by applying to the registering authority. Regulation 15 states that the registering authority can accept or refuse the grant of certificate of manufacture within 45 days of the date of the application. Regulation 16 states that in case a manufacturer wishes to manufacture a special mixture of fertilizers, such manufacturer needs to possess a certificate of manufacture for normal mixtures of fertilizers as a pre- requisite. Regulation 17 states that the tenure of the certificate is for 3 years unless suspended or cancelled earlier, and Regulation 18 provides for detailed provisions for the renewal of the certificate. Regulation 19 prohibits the manufacture, sale and distribution of fertilizers which do not comply with the prescribed standards, or are in contravention with the container, packing and name regulations, are adulterated, do not exhibit the minimum guaranteed percentage, or do not qualify as a fertilizer.

PACKAGING AND LABELLING

A "package" is a box, bottle, casket, barrel, tin, case, wrapper, receptacle, sack, bag or other object in which an insecticide is placed or packed.²² A "label" refers to any written, printed and/or graphic matter on the immediate package, which includes a covering in which such an immediate package is placed.²³ An insecticide is generally subject to 3 layers of packaging –

- "Primary package" the immediate package which contains the insecticides.²⁴
- "Secondary package" the package which is not a transportation package or a primary package; essentially the second protective layer.²⁵
- "Transportation package" the outermost package, which is used for transporting insecticides.²⁶

Misbranded Insecticide

An insecticide is "misbranded" wherein it contains a label with statements, designs or graphical representations which are false or misleading, or is packed in a

²² The Insecticides Act, 1968, § 2(1).

²³ Id. § 2(h).

²⁴ Insecticides Rules, 1971, Rule 2(j).

²⁵ *Id.* Rule 2(n).

²⁶ Id. Rule 2(q).

deceptive package, or if the label does not contain the requisite cautionary statement or warning to prevent risks to animals and/or human beings, or if any labelling or packaging conditions have not been complied with, or if any word or description which is required to be stated on the label or package of the insecticide has not been conspicuously displayed.²⁷ The manufacture, sale, export, and import of such substances is expressly prohibited,²⁸ and attracts penalty as already discussed in Chapter 7. Rule 16 (Insecticides Rules) prohibits the stockage, exhibition for sale, transportation or distribution of any insecticide if the same does not comply with the packing and labelling regulations provided under these Rules. Rule 17 provides that the package used for insecticides has to be approved by the Registration Committee and that before any insecticide is put inside a primary package, every batch has to be analysed.

Additional Packaging and Storing Obligations for Transportation

As per the Insecticides Rules, insecticide packages that are offered for transportation through railways have to be packed as per the Red Tariff, which is issued by the Ministry of Railways of the Government of India.²⁹ The Rule also specifically prohibits the transportation or storage of insecticides in a manner which makes them come in direct contact with foodstuff or animal feed. The Rule also prohibits the release of packages containing foodstuff or animal feed to the consignee if, due to some reason, it has been contaminated during transportation or storage by any insecticide. The Rule postulates that it is the duty of the storage owner and/or transport agency to take measures to prevent the poisoning or pollution of water or soil in case of any form of insecticide leakage. Rule 36 states that insecticide packages have to be stored in separate rooms or separate premises, away from the premises or rooms used for storing other material or articles. Moreover, the room used for storing insecticides has to be dry, well-lit, well-built, ventilated and with sufficient dimensions.

Toxicity Labels under the Insecticides Rules

The Rules provides for the spread of adequate awareness about the insecticide consumed in the market, especially with regards to toxicity. Rule 18 also requires 2 copies of the leaflet to be duly approved and signed by the Registration Committee and the Secretary, after which one copy will be sent to the State licensing officer and

²⁷ The Insecticides Act, 1968, § 2(k).

²⁸ Id. § 17.

²⁹ Insecticides Rules,1971, Rule 35.

one copy will be returned back to the manufacturer. Rule 19 states the manner in which labelling has to occur, and states that the following details have to be printed or written with indelible ink on the innermost container's label of any insecticide and simultaneously on the outermost covering of the container in which it is packed:

- 1. Name of the manufacturer;
- 2. Name of the insecticide;
- 3. Registration number of the insecticide;
- 4. The kinds and names of active ingredients and the respective percentages of each ingredient;
- 5. Net content of volume;
- 6. Batch number;
- 7. Expiry date; and
- 8. Antidote statement.

Rule 19 further requires the label to be affixed in such a manner that it cannot be removed with ordinary effort. It is also mandated that the label has to cover a prominent place. The lower portion of the square has to contain the following details-

Classification of Insecticides	Medium Lethal Dose by the Oral Route Toxicity LD 50 mg/kg. Body Weight of Test Animals	Medium Lethal Dose by the Dermal Route Dermal Toxicity LD 50/mg/ kg. Body Weight of Test Animals	Colour of Identification Band on the Label Affixed
Extremely Toxic	1-50	1-200	POISON

TABLE - 1

Highly Toxic	51-500	200-2,000	POISON
Moderately Toxic	501- 5,000	2,001-20,000	DANGER DANGER KEEP OUT OF THE REACH OF CHILDREN
Slightly Toxic	More than 5,000	More than 20,000	CAUTION

In addition to these requirements, Rule 19 also requires the label to contain additional information, such as inflammability of the insecticide, with such information having to be printed in Hindi, English and one to two regional languages of the region where the insecticide is going to be stocked or sold or distributed. No unwarranted claims of safety should be present on the label.

Packaging and Labelling Conditions under the Pesticides (Control) Order, 2018

Apart from placing bans on certain pesticides, the Order pristinely specifies the conditions of labelling and packaging for seven pesticides covered in the Order, which has to be incorporated from 8th August, 2018 onwards.³⁰ These conditions have been explicated below with the help of a table:

Pesticide	Labelling Conditions
Trifluralin	The label and leaflet have to contain a cautionary statement which clearly states that Trifluralin is harmful to aquatic organisms and therefore, should not be used near pisciculture areas, aquaculture areas or water bodies.
Alachlor	The label and leaflet have to contain a cautionary statement which clearly states that Alachlor is harmful to aquatic organisms and therefore, should not be used near pisciculture areas, aquaculture areas or water bodies.
Dichlorvos	The label and leaflet has to contain a cautionary statement which clearly states that Dichlorvos is harmful to aquatic organisms and therefore, should not be used near pisciculture areas, aquaculture areas or water bodies. Moreover, an additional warning has to be specified in the label or leaflet that Dichlorvos is toxic to honey bees and thus, should not be sprayed during the honey bees active foraging period in the day.
Phorate	The label and leaflet has to contain a cautionary statement which clearly states that Phorate is harmful to aquatic organisms and therefore, should not be used near pisciculture areas, aquaculture areas or water bodies. Moreover, an additional warning has to be specified in the label or leaflet that Phorate is toxic to honey bees and thus, should not be sprayed during the honey bees active foraging period in the day. A cautionary statement has to also be incorporated in the leaflet or label which states that Phorate is toxic to birds.
Phosphamidon	The label and leaflet has to contain a cautionary statement which clearly states that Phosphamidon is harmful to aquatic organisms and therefore, should not be used near pisciculture areas, aquaculture areas or water bodies. Moreover, an additional warning has to be specified in the label or leaflet that Phosphamidon is toxic to honey bees and thus, should not be sprayed during the honey bees active foraging period in the day. A cautionary statement has to also be incorporated in the leaflet or label which states that Phosphamidon is toxic to birds.

TABLE	-	2
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³⁰ Ministry of Agriculture and Farmer's Welfare, The Pesticides (Prohibition) Order 2018, S.O. 3951(E) (Notified on August 16, 2018).

Triazophos	The label and leaflet has to contain a cautionary statement which clearly states that Triazophos is harmful to aquatic organisms and therefore, should not be used near pisciculture areas, aquaculture areas or water bodies. Moreover, an additional warning has to be specified in the label or leaflet that Triazophos is toxic to honey bees and thus, should not be sprayed during the honey bees active foraging period in the day. A cautionary statement has to also be incorporated in the leaflet or label which states that Triazophos is toxic to birds.
Trichlorfon	The label and leaflet has to contain a cautionary statement which clearly states that Trichlorfon is harmful to aquatic organisms and therefore, should not be used near pisciculture areas, aquaculture areas or water bodies. A cautionary statement has to also be incorporated in the leaflet or label which states that Trichlorfon is toxic to birds.

Packaging and Labelling Regulations for Fertilizers

The Fertilizer (Control) Order, 1985, prohibits the sale, offer for sale, stockage, exhibition for sale or distribution of any fertilizer which has not been packed or marked as per the provisions postulated by the Order. It further prohibits fertilizers with false labels and misleading claims.³¹ Regulation 21 states that every manufacturer, importer or pool handling agency has to adhere to specific regulations under the Order for the packing and marking of fertilizers. These regulations are as under-

- 1. The container of every fertilizer has to be conspicuously packed and needs to contain the word "FERTILIZER". It should not bear any other particulars except the ones specified under the Order.
- 2. The container has to be sealed and packed in such a manner so as to prevent any form of tampering. If any fertilizer manufactured in India is packed in hand-stitched bags, such bags have to contain lead seals to ensure that tampering without breaking the seals is not possible. If the bags are machinestitched, they have to be stitched in a manner such that tampering cannot be done without breaking the stitches. This also applies to imported fertilizers that are put in hand-stitched bags.

Labelling and Packaging of Hazardous Chemicals

Rule 17 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 states that occupiers handling hazardous and other wastes have to ensure that packaging has been done as per the guidelines of the Central

³¹ Fertiliser (Control) Order, 1985, Reg. 19.

Pollution Control Board, and that labelling is done as per Form 8. On the perusal of Form 8, it is evident that the details required to be prescribed in the label are as follows-

- 1. Waste category and waste characteristics as stated in Part C of Schedule II and Schedule III appended to the Rules,
- 2. Incompatible wastes and substances,
- 3. Total quantity,
- 4. Date of storage,
- 5. Solid, semi- solid or liquid state of the waste,
- 6. Sender and Receiver's names, phone numbers, email IDs, contact persons and addresses.

Form 8 requires all labels to have a background colour of fluorescent yellow, with the words "HAZARDOUS WASTES" and "HANDLE WITH CARE" prominently imprinted in red in English, Hindi and other vernacular languages. The word "OTHER WASTES" has to be prominently imprinted in orange in English, Hindi and other vernacular languages. The label has to be weatherproof, and made out of nonwashable material.

STORAGE AND TRANSPORTATION

Framework under the Motor Vehicles Act, 1988

The Motor Vehicles Act, 1988 has been enacted to consolidate the laws relating to motor vehicles, and contains a few provisions for hazardous goods and chemicals³² that are capable of extending to agrochemicals. Section 14 of the Act provides for motor vehicle license issuing and renewal conditions, and specifies that in case the license is in respect of a transport vehicle that carries goods which are dangerous or hazardous, the license can only be effective for one year, after which application for renewal has to be made and the driver of such vehicle has to undergo a one day refresher course with the syllabus prescribed.

Section 78 of the Act states that while granting a goods carriage permit, the Regional Transport Authority has to consider the nature of goods with special attention to goods that are dangerous or hazardous to human life, and the nature of chemicals

³² The Motor Vehicles Act, 1988.

with special attention to protection of human life (which can include agrochemicals). Section 79 stipulates that in case a goods carriage permit is granted, it can contain special conditions for goods hazardous and dangerous for human life, making the provision capable of extending to agrochemicals. Section 146 states that any vehicle carrying hazardous or dangerous goods, which can include agrochemicals, has to be insured as per the provisions of the Public Liability Insurance Act, 1991. In addition to these provisions, the Motor Vehicles (Amendment) Act, 2019³³ has introduced few amendments that are relevant for the present purposes. An amendment in Section 27 of the principal Act has empowered the Central Government to make rules on the renewal conditions of licenses to drive transport vehicles which carry hazardous or dangerous goods, the term being capable of including agrochemicals.

Transportation and Movement of Hazardous Chemicals

The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 under Rule 18 provides that all necessary information has to be furnished to the transporter by the occupier through Form 9. In case inter-State movement is planned, a No Objection Certificate has to be obtained from the respective State Pollution Control Boards. Rule 19 has introduced the Manifest System for movement documents that have to be made in Form 10. Seven copies of the movement documents have to be made in different colour codes which have been listed below-

- 1. **White-** The first copy has to comply with the white colour code, and has to be forwarded by the sender to the State Pollution Control Board.
- 2. **Yellow-** The second copy has to comply with the yellow colour code, and has to be retained by the sender after the transporter affixes a signature on it.
- 3. **Pink-** The third copy has to comply with the pink colour code, and has to be retained by the receiver after receiving the waste.
- 4. **Orange-** The fourth copy has to comply with the orange colour code, and has to be handed over to the transporter by the receiver after accepting waste.
- 5. **Green-** The fifth copy has to comply with the green colour code, and has to be sent by the receiver to the State Pollution Control Board.
- 6. **Blue-** The sixth copy has to comply with the blue colour code, and has to be sent by the receiver to the sender.



³³ The Motor Vehicles (Amendment) Act, 2019.

7. **Grey-** The seventh copy has to comply with the grey colour code, and has to be sent by the receiver to the State Pollution Control Board in case the sender belongs to another State.

Storage obligations

Under the Insecticides Act, a "premise" includes any vehicle, land, shop, stall or place where insecticides are stored, *inter alia*.³⁴ A license is mandatory for the storage of insecticides in any place, even for the purpose of sale and the concerned person has to apply for a license in Form VI or Form VII to the respective licensing officer. Separate license applications and separate fees have to be incurred for each different place of storage of insecticides. Rule 10 also states that the license issued for the storage of insecticides has to be displayed in a conspicuous place in the premises, and has to comply with all the conditions postulated under the Act and Rules. The power of entry granted to Insecticides Inspectors under the Act is also extended to such transportation, and they also have the power to require the production, inspection and examination of any documents, records or registers maintained by a carrier indulging in transportation of insecticides for inquiry and examination as is deemed fit, to ensure that all the conditions of the Act and Rules are being followed.³⁵

The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989

Rule 2(e) defines "hazardous chemicals" as the list of chemicals listed in Schedule I, Schedule II and Schedule III appended to the Rules. On a perusal of the Schedules, it is evident that the Rules also apply to hazardous agrochemicals. Rule 7 states that an occupier has to obtain the approval of the Authority concerned to undertake any industrial activity, including storage and transport, and Rule 8 states that the authority concerned has to be notified if there is any change in the threshold quantity in respect of storage or transport of hazardous chemicals. Rule 10 requires the occupier to undertake any industrial activity, including the transport and storage of hazardous chemicals, only after submitting a safety report to the authority concerned, 90 days before commencing such activity. The Rule also requires the occupier to prepare annual safety audit reports.

³⁴ The Insecticides Act, 1968, § 3(m).

³⁵ Id. § 21.

Provisions under the Public Liability Insurance Act, 1991

Section 2(d) of the Act has defined "hazardous substance" to be in consonance with the definition provided under the Environment (Protection) Act, 1986 and on perusal of the same it is evident that the definition also includes agrochemicals within its ambit. Section 4 of the Act makes it the duty of every owner or person who has control over the handling of hazardous substances (including some agrochemicals), which includes their transportation, to take out one or more insurance policies till the entire transportation process is finished, for the purposes of granting relief for death or injury of any person who is not a workman. Section 10 of the Act empowers any person authorised by the Central Government for that purpose to render the necessary assistance at all reasonable times in, *inter alia*, vehicles handling (which includes transporting) of hazardous substances including agrochemicals, to check compliance with the provisions of the Act. Section 11 permits the search and seizure of hazardous substances including agrochemicals if any contravention of the Act is found. Moreover, as per Section 13, if the Central Government or any person authorised by the Central Government notes a contravention of the Act in the handling (including transportation) of hazardous substances, they may apply to a Court not inferior to a Judicial Magistrate First Class or Metropolitan Magistrate from restraining the handling (transportation) of such hazardous substances (which includes agrochemicals).

SALE AND DISTRIBUTION

License and Registration for Distribution and Sale

Temporary prohibitions can been imposed as per Section 27 which if not complied with the sale, exhibition for sale or distribution of such insecticide would be contrary to the conditions of the license held by that person. Furthermore, the sale of insecticides prohibited as per the Pesticides (Control) Order, 2018 is also prohibited. Rule 10 of the Insecticides Rules states that renewal applications for the sale, distribution or exhibition for sale of insecticides have to be made in Form VI or Form VII.

Sale and Distribution of Fertilizers

The sale and distribution of fertilizers is classified and distinguished under the Fertilizer Order. Regulation 25 restricts the sale or use of fertilizers without the

prior permission of the Central Government, and in compliance with the conditions laid down by the Central Government, unless it is used for agricultural purposes to increase soil and crop productivity.

Price Control and Regulation of Distribution

Regulation 3 empowers the Central Government to regulate the equitable distribution of fertilizers through price control, which every dealer or manufacturer will have to adhere to. Regulation 4 requires the dealer who makes an offer for the retail sale of fertilizers to conspicuously display the quantities of fertilizers held by them each day, and a list of prices of such fertilizers in the place of business. Regulation 6 empowers the Central Government to ensure the equitable distribution and availability of fertilizers to farmers by instructing the manufacturer or seller to produce and allocate certain quantities to one State or various States in India through notification.

Import

Import of Insecticides

A Registration Certificate is required even for importing regulated insecticides, under Section 9 of the Act. The Registration Committee has to verify the claims of the importer by scrutinizing the formulae of the insecticide and assessing the damage it is capable of inflicting upon human health and animal health. After such an examination and the payment of the fees by the applicant, the Committee can grant the registration number and registration certificate, on the conditions it deems fit. However, if the Committee finds out that the insecticide is harmful for human or animal health, it may choose to refuse registration.

The importer is required to maintain a stock register in Form XV for technical grade insecticides and in Form XVI for formulated insecticides. The Rule has also empowered the Central Government or the State Governments to furnish information on any batch of insecticides imported.³⁶ The import of any misbranded insecticides is also prohibited, and penalty is attached to such an importer who is in violation of any registration conditions and obligations. The pesticides that are banned under the Pesticides (Control) Order, 2018 are also prohibited from being imported into the country.

36 *Id.* Rule 15.

Import Registration for Fertilizers

Under the Fertilizer Order, a "certificate of source" is required for import, which is defined as, *inter alia*, a certificate given by an importer to show the source of the fertilizer. In the Order, "dealer" has been defined as a person who carries on the business of selling fertilizers, and includes importers and their agents. Furthermore, "pool handling agencies" have also been established, that are agencies entrusted by the Central Government to carry out the functions of the handling and distribution of imported fertilizers. Every person, including an importer or a pool handling agency, has to apply for registration before the Notified Authority under Regulation 8, for sale or offer for sale of fertilizers. The Controller can either choose to grant the registration for a period of 3 years or refuse the same if it is found that a previous registration certificate of the same person or agency has been suspended or cancelled, or if such person or agency has been convicted under the Act or any of its Orders, or if there is failure of enclosing certificate of source, or for the simple reason that the application is incomplete as per Regulations 9 and 10. Regulation 11 provides detailed provisions for the renewal of registration.

Prohibitions and Specifications on Imports

Regulation 19 specifically prohibits the import of fertilizers that are not of the prescribed standards. The Regulation further prohibits the use of misleading and fictitious labels for imported fertilizers. Regulation 20 empowers the Central Government to fix specifications for all fertilizers that are imported into India. Regulation 21 requires importers and pool handling agencies to pack and mark the container of fertilizers with "FERTILIZER", and requires the inscription of only those particulars which are permitted by law.

Regulation 25 prohibits the sale of imported fertilizers for any other purposes except agriculture unless the requisite permissions and registrations have been obtained. Regulation 28 empowers the Inspector appointed under the Order to require any pool handling agency or importer to furnish information in respect of any batch of fertilizers, along with conferring the power of entry and search of premises where imported fertilizers are stored or kept for sale. Regulation 35 requires importers and pool handling agencies to inform the Director of Agriculture of the State where such importer or pool handling agency wishes to dispatch imported fertilizers, 15 days prior to such import. The details which are supposed to be furnished are as under-
- 1. Name of the fertilizer;
- 2. Name of the country from where such fertilizer has been imported;
- 3. Name of the manufacturer;
- 4. The quantity of fertilizers which is going to be imported;
- 5. Date of consignment arrival;
- 6. Name of the port of discharge; and
- 7. Other information as required.

Import Obligations under the Hazardous Chemical Rules

Rule 17 provides that a container of any hazardous chemical covered under the Rules has to, *inter alia*, contain the name of the importer. Rule 18 requires an importer of hazardous chemicals to furnish the following information to the authorities concerned 30 days before import -

- 1. Name and address of the person who will be receiving the consignment of hazardous chemicals in India;
- 2. Port of entry in India;
- 3. Mode of transport used from the exporting country to India;
- 4. Quantity of hazardous chemicals being imported;
- 5. Full product safety information.

After the receipt of such information, if the authorities concerned feel that the import of hazardous chemicals can lead to major accidents, it is empowered to direct the importer to take such safety measures as it may deem necessary. The authorities are empowered to even restrict the import of such chemicals if it is found that such chemicals are unsafe for human health and the environment. The authorities concerned can also direct Port Authorities to take appropriate steps for handling and storage of hazardous chemicals during off-loading of consignment. The importer of hazardous chemicals has to maintain full records related to the hazardous chemicals imported, and the concerned authorities or State authorities or officers of the Ministry of Environment and Forest can conduct inspections of the same at all reasonable times.



Schedule 10, appended to the Rules, requires the importer to maintain records which contain the following information about the import of any hazardous chemical-

- 1. Name and address of the importer of hazardous chemical;
- 2. Date and reference number of the permission which permitted the import of hazardous chemical;
 - 3. Description of the hazardous chemical which includes the physical form, chemical form, total volume and weight;
 - 4. Description of the purpose of import; and
 - 5. Description of storage of hazardous chemicals such as date and method of storage.

ITC (HS) Import Policy, 2017

As per the ITC (HS) Import Policy, 2017, if Boric Acid is imported for non-insecticidal purposes, an import permit has to be taken for it from the Central Insecticides Board and the Registration Committee established under the Insecticides Act, 1968. The import of Urea, whether or not in an aqueous solution, is only allowed as per the conditions specified in Foreign Trade Policy 2015- 2020. In case of Ammonium Nitrate, whether or not in an aqueous solution, import is not regulated unless the substance contains more than 45% of Ammonium Nitrate by weight, as is found in gels, melts or suspensions. In such cases, licenses from the Chief Controller of Explosives will have to be taken. The import of Aluminium Phosphate such as Phostoxin, Calcium Cyanide, Dimethyl- Dichloro- Vinyl- Phosphate (DDVP), Diaginal, Methyl Bromide, Dimethoate (Technical Grade), Malathion, Endosulfan (Technical Grade), Quinalphos, Isoproturon, Fenthion, Cypermethrin (Technical Grade), Allethrin, Synthetic Pyrethrum, Insect Repellants, Paper Impregnated or Coated with Insecticides, Fungicides, Herbicides, Anti- Sprouting Products and Plant Growth Regulators is free, unless the same is specifically restricted under the Insecticides Act, 1968.

Export

Export of Insecticides and Fertilizers

Although the Insecticides Act does not directly contain any provisions on the export of insecticides, a few ban notifications have permitted the export of certain insecticides. One such insecticide is Captafol which, after 25th July, 1989, was banned for use as

a foliar spray, and it can only be used as a seed dresser.³⁷ Moreover, after 17th July, 2001, the manufacture of captafol 80% powder for dry seed treatment was banned, and only manufacture for export was permitted.³⁸ Similarly, Dichloro-Diphenyl-Trichloroethane (DDT) is another agrochemical the export of which had to be strictly regulated as per the Articles of the Rotterdam Convention after 2006.³⁹

The Fertilizer (Movement Control) Order, 1973 has been formulated by the Central Government, in exercise of the powers conferred under Section 3 of the Essential Commodities Act, 1955, and contains a few provisions on the export of fertilizers.⁴⁰ Regulation 3 prohibits the export, attempt to export or abetment to export of fertilizers which has already been allocated by the Government to any State. Regulation 4 grants powers to the appointed Inspector to stop and search any person, vehicle, boat or receptacle which is being or is intended for being used for the export of fertilizers.

IHC (HS) Export Policy, 2018

Chapter 31 of the Export Policy, 2018 mandates some conditions for the export of fertilizers. The export of urea is only permitted if the exporter bears a license for the same. The export of Straight Phosphatic Fertilizers such as single super phosphate, 16% powdered, single super phosphate in 14% powdered form and single super phosphate in 16% granulated form has been kept free, but the manufacturers desirous of exporting the same have to intimate the quantities to the Department of Fertilizer along with a self- declaration and a certificate issued by statutory auditors that no concession has been claimed for undertaking such export. The self- declaration and the certificate issued by the authority have to be furnished to the Customs Authorities on export. Similar process exists for N.P. Complex Fertilizers such as Diammonium Phosphate, (Nitrophosphate with Potash 15-15-15), etc.

The conditions for the export of Straight Potassic Fertilizers, such as Potassium Chloride (Muriate of Potash), are that export is only permitted if granted by the Department of Fertilizer to direct the importers out of quantity of import made in the last 6 months only if concession is not claimed. If any concession is claimed, it will be returned to the Government. Export realization will be in free foreign exchange only,

³⁷ Ministry of Agriculture, S.O. 569(E), (notified on July 25, 1989).

³⁸ Ministry of Agriculture, S.O. 679(E) (Notified on July 17, 2001).

³⁹ Ministry of Agriculture, S.O. 295(E) (Notified on Mar. 8, 2006).

⁴⁰ Ministry of Chemicals & Fertilizers, The Fertiliser (Movement Control) Order, 1973, S.O. 383 (E) (notified on Apr. 28, 1995).

and a certificate from the statutory auditors must be furnished to the Department of Fertilizers verifying that the quantity to be exported has been imported within the last 6 months, and no subsidy or concession has been claimed. For chemical fertilizers fortified with zinc or boron and micronutrient fertilizers and its mixtures containing NPK, there are no export conditions except the requirement of an export license.

Import and Export Obligations under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016

Rule 12 specifically restricts the import of hazardous and other wastes from other countries to India for disposal. However, the import of hazardous wastes listed under Part A of Schedule III may be allowed if the prior informed consent of the exporting country, and the permission of the Ministry of Environment, Forest and Climate Change, has been obtained. The export of hazardous and other wastes is permitted only if it is listed in Part A and Part B of Schedule III and Schedule VI, and the permission has to be granted by the Ministry of Environment, Forest and Climate Change. Rules 13 and 14 lay down detailed procedures for effectuation of the import and export of hazardous wastes.

Interestingly, illegal trafficking has been specifically covered under Rule 15. The import and export of hazardous wastes is considered as illegal traffic if-

- 1. It has been conducted without the prior permission of the Central Government, as is required by these Rules;
- 2. The permission has been obtained by the Central Government through fraud, misrepresentation and falsification;
- 3. The export or import does not conform to the shipping details that has been provided in the movement documents; or
- 4. The disposal is deliberate and in contravention of the Basel Convention, the general principles of international law, or domestic laws.

PUBLIC SAFETY CONCERNS

Under the Insecticides Act, the posts of Insecticides Analyst⁴¹ and Insecticides Inspector⁴² have been established. Section 23 requires that every person is duty

⁴¹ The Insecticides Act, 1968 § 19.

⁴² *Id.* § 20.

bound to inform the Insecticide Inspector regarding the area in the premises where an insecticide is being manufactured or kept for distribution or sale. Section 25 empowers the Inspector to confiscate any pesticide that is being manufactured, used or being kept for sale or distribution in contravention of the Act or Rules. Further, the Central Government can prohibit the sale, distribution or use of any batch of insecticides that are found to be harmful for the public safety for a temporary period, pending investigation. If after investigation it is found to be unsafe and hazardous, the registration can be refused or cancelled. Section 28 states that cancellation of registration will have to be notified by way of a Gazette Notification. The Insecticides Rules, 1971 elaborate on the functions of laboratories to analyse and test samples and materials that are sent by the relevant authorities, which include testing and analysing samples which have been obtained by persons violating the manufacture, distribution, sale or use provisions under the Act.⁴³

HANDLING AND DISPOSAL

Handling and Disposal of Insecticides

The Insecticides Act also contains a few provisions on the handling and disposal of insecticides. Section 36 empowers the Central Government to make rules on the precautions to be taken against poisoning that has been caused due to handling of insecticides, on the disposal of surplus materials in insecticides, and medical examinations of workers that are engaged in the handling of insecticides. Further, Rule 41 (Insecticides Rules) requires manufacturers, distributors, and persons who undertake the commercial spraying or use of insecticides to maintain sufficient stocks of first aid tools, equipment, antidotes, injections and other medicines to treat poisoning that arises out of contact with skin, inhalation, eye contamination or swallowing. Rules 37 and 38 provide for medical examination and first aid measures for workers that are involved in the handling of insecticides. Rule 39 requires such workers to mandatorily wear protective clothing, including the following-

- 1. Protective outer garment, protective overalls, protective hoods and protective hats;
- 2. Rubber gloves and other protective gloves which extend halfway up to the forearm, made out of material that is impermeable to liquids;
- 3. Boots;

⁴³ Insecticides Rules, 1971, Rule 5.

4. Dust proof goggles.

Rule 40 prescribes that workers involved in the handling of insecticides have to also wear respiratory devices to prevent the inhalation of toxic dust and gas vapours. The following types of respiratory devices have to be given to workers- Chemical Cartridge Respirator; Supplied Air Respirator; Demand Flow Type Respirator; or Full Face or Half Face Gas Masks with Canisters.

Disposal of Fertilizers

The Fertilizer Order contains some regulations regarding the disposal of fertilizers. Regulation 23 specifies conditions for the disposal of non- standard fertilizers. The containers of such non- standard fertilizer has to be superscribed with a red 'X' in a conspicuous manner , and an application in Form H has to be submitted to the Notified Authority so that the sale of such non- standard fertilizers can be made to the manufacturers of fertilizer mixtures, research farms, Governments, Universities or similar entities. Regulation 28 empowers the Inspector appointed under the Act to require information from any manufacturer, importer, pool handling agency, retail dealer or wholesale dealer, in respect of the disposal and handling of fertilizers.

Procedure under the Hazardous and Other Wastes Rules

Rule 4 states that the occupier is duty bound to prevent, minimise, reuse, recycle, recover and safely dispose of hazardous and other wastes. The occupier is responsible for handling and disposal in an environment friendly manner, preventing accidents, and training its own personnel involved in handling and disposal. Rule 6 requires the occupier of a facility to apply through Form 1 to the State Pollution Control Board in case such occupier is involved in the handling and disposal of hazardous and other wastes. If granted authorisation, the occupier is supposed to maintain detailed records of the hazardous and other wastes managed by them.

USE OF AGROCHEMICALS

The use of agrochemicals, by way of pest control operations and other methods, is also regulated. The Insecticides Rules lay down detailed provisions regarding the same. The persons who wish to undertake pest control operations by using Methyl Bromide, Ethylene Dibromide, or Aluminium Phosphide have to apply for a license as per Form VI-A, and pay a fees of ₹ 1,000 for each place of operation under Rule 10. The tenure of such license cannot be more than 5 years, and after the completion

of the tenure, the pest control operator has to apply for a further 5-year extension as per Form VI-B, along with renewal fees of ₹ 1,000 for each place of operation. For the licensing of other insecticides, an application under Form VI-C has to be made. Rule 10 also provides that any applicant that wishes to undertake pest control operations after obtaining a license should have graduated with a degree in Agriculture or Science with Chemistry, or a degree including the aforementioned subjects, with a minimum 15-day training with the Indian Grain Storage Institute, Hapur, Central Food Technological Research Institute Mysore, or National Plant Protection Training Institute, Hyderabad. If a pest control operator wishes to undertake fumigation, Rule 10 mandates that special permission needs to be obtained from the Plant Protection Adviser to the Indian Government.

Rule 43 prescribes rules for the use of insecticides in aerial spraying operations. The aerial spraying operators are made responsible for the marking of the area, the use of only approved insecticides or their formulations at the permitted height and concentration levels, for providing first aid and washing or decontamination facilities, for ensuring the prevention of entry by animals or persons that are unassociated with such operations, and the administration of efficacious training to pilots in specialised aspects of the operations, such as the clinical effects of the use of insecticides. Section 29 of the Act also states that the use of an insecticide in contravention of the Act and Rules is punishable with a fine not less than ₹ 500 but not exceeding ₹ 5,000 and/or imprisonment upto 6 months. It is noteworthy that the penalty provisions under the Act were amended by the Insecticides (Amendment) Act, 2000.⁴⁴

FOOD SAFETY CONCERNS OVER AGROCHEMICALS

The safety of food is another major concern regarding the use of agrochemicals, especially pesticides. Food poisoning cases in India due to pesticide contamination are a major concern.⁴⁵ The Prevention of Food Adulteration Act, 1955 is pertinent in checking the flow of pesticide and pesticide residue into the food chain. The Food Safety and Standards Act, 2006 was enacted to consolidate the law of food safety in India, and to establish the Food Safety and Standards Authority of India to regulate

⁴⁴ The Insecticides (Amendment) Act, 2000.

⁴⁵ Alvaro Javier Idrovo, Food Poisoned with Pesticide in Bihar, India: New Disaster, Same Story, 71(3) Occupational and Environmental Medicine 228 (2014; See also Andrew J. Yoder, Lessons from Stockholm: Evaluating the Global Convention on Persistent Organic Pollutants, 10(2) Indiana Journal of Global Legal Studies 113 (2003).

the manufacture, storage, sale, import and distribution of food.⁴⁶ It contains a few provisions on the use of insecticides and pesticides.

Section 2(zz) defines the term "unsafe food", and includes food which contains pesticides in excessive amounts. Section 13 establishes a Scientific Panel, the members of which must be appointed by the Food Authority for dealing with pesticide residues in food. Section 16 of the Act specifies the duties and functions of the Food Authority, which include the formulation of regulations that specify limitations on the use of pesticides in food based crops, and limit the amount of permitted pesticide residue in food. Section 21(1) prohibits the existence of pesticides or insecticides residue in excess of the specified tolerance limit. Moreover, Section 21(2) directly prohibits the use of all insecticides in food, except in the case of fumigants which are registered under the Insecticides Act, 1968.

Since food containing insecticides and pesticides in excess of the specified limit falls under the category of unsafe food under the Act, the penalty specified for dealing in unsafe food under Section 59 will be applicable. Therefore, even if the existence of such pesticide or insecticide in food does not cause injury, imprisonment for upto 6 months and/or fine upto ₹ 1 lakh can be imposed. If a non- grievous injury is caused, imprisonment upto 1 year and/or fine upto ₹ 3 lakhs can be imposed. If grievous injury is caused, imprisonment upto 6 years or fine up to ₹ 5 lakhs may be imposed. If death is caused, imprisonment of not less than 7 years which can extend upto life imprisonment and/or fine upto ₹ 10 lakhs can be imposed on the person found guilty.

INTERNATIONAL INSTRUMENTS GOVERNING AGROCHEMICALS IN INDIA

BASEL CONVENTION

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal contains few articles on the transportation of hazardous wastes, the term being capable of including agrochemicals in its ambit.⁴⁷ It is the most comprehensive global treaty dealing with hazardous waste materials throughout their lifecycles, from production and transport to final use and disposal.⁴⁸ Article 2 of the Convention defines "management" to include, *inter alia*, the transportation of

⁴⁶ The Food Safety and Standards Act, 2006.

⁴⁷ Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, March 22, 1989, 1673 U.N.T.S. 126.

⁴⁸ Basel Rotterdam and Stockholm Conventions, UNITED NATIONS INSTITUTE OF TRAINING AND RESEARCH, https://unitar.org/sustainable-development-goals/planet/our-portfolio/basel-rotterdam-stockholm-conventions (last visited May 30, 2020).

hazardous wastes and other wastes, or wastes arising from agrochemicals. Addressing the issues of pesticide stocks is one of the key issues in the framework of the Basel Convention, and has been recognized by different countries. The Conference of Parties of the Convention has given the Secretariat a mandate to help solve obsolete pesticides problems, especially in developing countries.⁴⁹ The primary goal is to handle and dispose scheduled wastes in an environmentally-sound manner.⁵⁰

India's Agrochemical Sector and the Basel Convention

India signed the Basel Convention on 15th March, 1990, and ratified it on 24th June, 1992.⁵¹ Therefore, all the Articles in the Convention pertaining to the transportation, storage, transboundary movement, export, import and disposal are capable of being applyicable to all Indian hazardous and other wastes generated out of agrochemicals. In its National Hazardous Waste Management Strategy, India has also classified "date-expired products such as pesticides and medicines" as hazardous waste.⁵²

The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 implement the provisions of the Basel Convention in India. The hazardous wastes eligible for import and export have been provided under Annexure VIII of the Basel Convention, and the same list can also be found in Part A of Schedule III appended to the Rules. Similarly, other wastes that are eligible for import and export have been provided under Annexure IX of the Basel Convention, and the same list can also be found in Part B of Schedule III of the Rules. Part D of Schedule III appended to the Rules also covers other wastes provided under Annexure IX of the Basel Convention, whose import and export does not require permission of the Ministry of Environment, Forest and Climate Change. Schedule VI of the Rules prohibits the import of certain hazardous and other wastes, and the list has also been provided under the Basel Convention. Schedule VIII of the Rules covers the list of documents which require verification by the Customs of State Parties when other wastes are being imported. Therefore, it can be said that the domestic incorporation

⁴⁹ See FAO Pesticide Disposal Series: Country Guidelines, Food and Agricultural Organisation, http://www.fao.org/3/a-y2566e.pdf (last visited May 30, 2020).

⁵⁰ Basel Convention art. 4.

⁵¹ Parties to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, BASEL CONVENTION, http://www.basel.int/Countries/StatusofRatifications/ PartiesSignatories/tabid/4499/Default.aspx (last visited May 30, 2020).

⁵² Ministry of Environment and Forests, Government of India, National Hazardous Waste Management Strategy.

of the Basel Convention obligations has been undertaken through the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

ROTTERDAM CONVENTION

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade has aided in information exchange between nations, which has resulted in better regulation of the manufacture, distribution, sale and use of hazardous pesticides⁵³ particularly in the context of their international trade, and has emphasised shared responsibility and cooperative efforts among Parties.⁵⁴ Chapter 7 has extensively dealt with the Rotterdam Convention and its impact on the India agrochemical sector. A detailed discussion on the different laws and regulations that govern the sector has also been made.

STOCKHOLM CONVENTION

The Stockholm Convention on Persistent Organic Pollutants has been signed and ratified with the objective of protecting human health and environment from persistent organic pollutants.⁵⁵ Article 3 of the Convention states that every State Party has to prohibit, and take legal and administrative measures to eliminate the production and use of, chemicals listed in Annexure A. The Article mandates that any State Party with one or more regulatory or assessment schemes for new pesticides has to take concrete measures to regulate the same, with the aim of preventing the production and use of new pesticides if such pesticides possess the characteristics of a persistent organic pollutant. If any exemption is granted by a State Party in respect of Annexure A or Annexure B chemicals, the State Party concerned has to further ensure that the production and use are only happening for the purposes of the exemption, and all the applicable standards and guidelines are being adhered to. Article 4 requires the State Parties to maintain a register of exemption given to Annexure A and Annexure B chemicals, which includes exemptions pertaining to production and use.

Article 9 of the Convention states that every State Party has to facilitate or undertake the exchange of information pertaining to the reduction or elimination of the use or production of persistent organic pollutants. Annexure A, appended to the Schedule,

⁵³ Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, Sept. 10, 1998, 38 ILM (1999).

⁵⁴ *Overview of the Rotterdam Convention*, UNITED NATIONS ENVIRONMENT PROGRAMME, http://www.pic.int/ TheConvention/Overview (last visited May 30, 2020).

⁵⁵ Stockholm Convention on Persistent Organic Pollutants, May 22, 2001, 2256 U.N.T.S. 119.

lists a few pesticides whose production and use is eliminated wholly or partially, depending upon the pesticide. The Annexure completely prohibits the production of Aldrin, and forbids the use of Aldrin except if used as a local ectoparasiticide or insecticide. The production of Chlordane is completely prohibited unless the State Party has listed the respective exemptions in the Register. The use of chlordane is eliminated unless it is used as an insecticide or local ectoparasiticide, or as a termiticide or additive in plywood adhesives. The production of Dieldrin is completely banned unless it is produced for use in agricultural operations. The production and use of Endrin is completely forbidden. The production of Heptachlor is completely banned unless it is produced for use as termiticide, or for wood treatment. The production of Hexachlorobenzene is completely prohibited unless the State Party lists the exemption in the Register. Its use is permitted only as an intermediate solvent in pesticides. The production and use of Toxaphene is completely prohibited.

Annexure B appended to the Schedule lists the restrictions on DDT, and states that the acceptable purpose of production is for disease vector control till used as per the guidelines under Part II of Annexure B. It can also be produced for use in the production of Dicofol. Annexure E postulates the manner of the collection of data regarding the production and uses of persistent organic pollutants covered under the Convention, including the quantity and location of production, for evaluating the hazards on human health and the environment.

Transportation, Storage, Import and Export, Handling and Disposal

The Stockholm Convention on Persistent Organic Pollutants has been formulated to protect human health and the environment from persistent organic pollutant,⁵⁶ and includes agrochemicals within its ambit. It contains some provisions on the transportation and storage of persistent organic pollutants. Article 6 requires the State Parties to take appropriate measures in respect of persistent organic pollutant wastes to be stored and transported in an environmentally sound manner. The Article also requires that the transportation of persistent organic pollutants should strictly adhere to relevant international guidelines, rules and standards.

The Stockholm Convention contains some provisions on export and import of agrochemicals, which are relevant for the present purpose. Article 3 of the Convention states that State Parties have to take legal and administrative measures to eliminate

56 Id.

the import and export of chemicals which are covered under Annexure A appended to the Convention. Furthermore, Article 15 of the Convention requires each State Party to report to the Conference of Parties, with statistical information on total quantities of import and export of each Annexure A and B chemical. Annexure A lists chemicals which are to be eliminated, and Annexure B names those which are to be restricted.

Article 3 of the Stockholm Convention requires State Parties to ensure the environmentally sound disposal of the chemicals listed under Annexure A and Annexure B. Article 6 states that appropriate measures have to be taken by the State Parties to ensure that when persistent organic pollutants turn into wastes, they are handled properly. Article 6 also requires State Parties to dispose of persistent organic pollutant wastes in such a manner so as to ensure the irreversible transformation and complete destruction of the same. Moreover, any disposal operation which can lead to the recycling, recovery, reclamation, direct reuse or alternative uses of persistent organic pollutants is prohibited.

Stockholm Convention and India's Agrochemical Sector

India signed the Stockholm Convention on 14th May, 2002 and ratified it on 13th January, 2006.⁵⁷ Therefore, India is obligated to ensure the regulation of persistent organic pollutants. In 2011, India formulated a National Implementation Plan for the Stockholm Convention.⁵⁸ As far as waste generated from persistent organic pollutants of the agrochemicals sector is concerned, the Hazardous and Other Wastes (Management and Transboundary) Rules, 2016 will apply. The Ministry of Environment, Forest and Climate Change has formulated the Regulation of Persistent Organic Pollutants Rules, 2018 in exercise of the powers conferred under Section 3 and Section 6 of the Environment (Protection) Act, 1986 read with Rule 13 of the Environment (Protection) Rules, 1986.⁵⁹ These Rules have been directly formulated in consonance with the Indian obligations enshrined under the Stockholm Convention. They prohibit the manufacture, trade, use, import and export of few persistent organic pollutants, which are also agrochemicals, under Rule 2. The list is given below-

1. Chlordecone;



⁵⁷ *Status of Ratification*, STOCKHOLM CONVENTION, http://chm.pops.int/Countries/StatusofRatifications/ PartiesandSignatoires/tabid/4500/Default.aspx (last visited May 30, 2020).

⁵⁸ GOVERNMENT OF INDIA, NATIONAL IMPLEMENTATION PLAN, STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS (2011), http://admin.indiaenvironmentportal.org.in/files/UNEP-POPS.pdf

⁵⁹ Regulation of Persistent Organic Pollutant Rules, 2018.

- 2. Hexabromobiphenyl;
- 3. Hexabromodiphenyl Ether and Heptabromodiphenyl Ether (Commercial Octa- BDE);
- 4. Tetrabromodiphenyl Ether and Pentabromodiphenyl Ether (Commercial Penta- BDE);
- 5. Pentachlorobenzene;
- 6. Hexabromocyclododecane; and
- 7. Hexachlorobutadiene

Rule 3 requires the occupier to disclose the amounts of stockpile of the 7 chemicals listed in Rule 2. Rule 4 prohibits occupiers from draining or discharging such chemicals, and Rule 5 demands their disposal as per the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. Therefore, it would not be wrong to infer that a plethora of persistent organic pollutants still remain to be regulated efficiently in India.⁶⁰

However, more recently, the United Nations Environment Programme (UNEP), the United Nations Industrial Development Organisation, and Central Pollution Control Board (CPCB) of India have agreed to jointly initiate a project for reducing the production, use and consumption of DDT, to fulfill the obligations under the Stockholm Convention.⁶¹

MINAMATA CONVENTION

The Minamata Convention on Mercury was signed to protect human health and the environment from anthropogenic emissions and releases of mercury and its compounds.⁶² It contains some provisions on the storage of mercury. Article 3 of the Convention requires State Parties to ensure the environmentally sound interim storage of Mercury as provided under Article 10, while undertaking the export of mercury or mercury compounds. Article 6 of the Convention states that an exemption

⁶² The Minamata Convention on Mercury, Oct. 10, 2013, C.N. 560.2014.



⁶⁰ See Country Situation in Persistent Organic Pollutants in India, INTERNATIONAL POPS ELIMINATION PROJECT (2004), https://ipen.org/sites/default/files/documents/4ind_india_country_situation_report-en.pdf page 12.

⁶¹ *India seeks better alternative to persistent organic pollutants*, UNITED NATIONS ENVIRONMENT PROGRAMME (Dec. 16, 2019), https://www.unenvironment.org/news-and-stories/story/india-seeks-better-altern atives-persistent-organic-pollutants.

may be sought by the State Parties, and the Conference of the Parties may extend exemptions to State Parties in case of activities undertaken by the State Party concerned for the environmentally sound storage of mercury.

Article 4 prohibits the import and export of mercury-added products listed in Annexure A after the specified phase-out date, unless exclusion has been provided for that product under Annexure A itself and the State Party has a registered exemption to that effect. The prescribed year for the phasing out of the mercury added products specified in Part I of Annexure A is the year 2020, after which import and export of the same will not be permitted. The list, in addition to batteries, switches and relays, compact fluorescent lamps (CFLs), high pressure mercury vapour lamps (HPMV), and cosmetics (with mercury content above l ppm), also includes pesticides, biocides and topical antiseptics.

India's Agrochemical Sector and the Minamata Convention

India signed the Minamata Convention on 30th September, 2014 and ratified it on 18th June, 2018.⁶³ Although India will have to phase out mercury compounds and products made out of mercury or containing mercury within the duration of time stipulated in the Convention, no ban order, notification or law has been passed to this effect in India till this date.

CONCLUSION

There is a plethora of laws, rules and regulations governing the Indian agrochemical sector that comprises of insecticides, fungicides, fumigants, herbicides, biopesticides, plant growth regulators, organic and inorganic fertilizers, nematicides, and rodenticides. While the country has a robust set of laws, what remains to be seen is whether compliance and implementation of these regulatory requirements are met with by the agrochemical sector. In so far as insecticides and pesticides are concerned, a number of regulations have been framed that regulate every stage of the life cycle starting from manufacture to final disposal. The primary legal instrument governing fertilizers is the Fertilizer (Control) Order, 1985. As opposed to chemical insecticides and pesticides, regulations governing chemical inorganic fertilizers and mixed fertilizers are lesser in number because of the numerous bio-fertilizers and vermicomposts and other organic fertilizers available with farmers that serve

⁶³ Parties and Signatories, MERCURY CONVENTION, http://www.mercuryconvention.org/Countries/Parties/tabid/3428/language/en-US/Default.aspx (last visited May 30, 2020).

as sustainable alternatives to the chemical fertilizers. India is making efforts to ban several hazardous and highly hazardous insecticides and pesticides and revamp its laws to align them with its international obligations under the different multilateral environmental agreements to which it is a party. India has classified "date-expired products such as pesticides and medicines" as hazardous waste in its National Hazardous Waste Management Strategy and has complied with the requirements of the Basel Convention by enacting several waste management rules including the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016. The Rotterdam Convention is significant for the agrochemical sector and India has banned several insecticides in pursuance of Annex III to the Convention. Additionally, the Stockholm Convention is also relevant since several pesticides are persistent organic pollutants that cause irreversible harm to human and animal health and the environment. India has formulated the Regulation of Persistent Organic Pollutants Rules, 2018 in consonance with its obligations under the Stockholm Convention that prohibits the manufacture, trade, use, import and export of few agrochemicals that are persistent organic pollutants. In the agrochemical sector the country is making efforts to comply with most international obligations that require the country to be mindful of the hazardous chemicals and waste generated from the use of chemical fertilizers and insecticides and the harmful impact that they pose.

CHAPTER 15

LAWS REGULATING THE PETROCHEMICAL SECTOR IN INDIA

INTRODUCTION

Petrochemicals primarily constitutes of hydrocarbons, besides other chemical compounds. Hydrocarbons are derived from crude oil and natural gas. Some major chemicals which are produced by the process of crude oil distillation are petroleum gases, naphtha, kerosene and gas oil. The aforementioned are the main feed stocks for the petrochemical industry. Other important feedstocks used in the petrochemical industry that are obtained from natural gas are ethane, propane and natural gas liquids.¹ The Ministry of Petroleum and Natural Gas is the concerned authority at the Central level for exploration, production, refining and distribution of Oil and Natural Gas. Further, to market, import, export and conserve petroleum products, the Ministry makes appropriate policies and frames guidelines. The Department of Chemicals and Petro-Chemicals (DCPC) is the authority to formulate and implement policy and programmes for the petrochemical sector in the country. Petrochemical industry has huge value addition in terms of products that are derived from the crude oil. It is also estimated that the Petrochemical industry will contribute to more than a third of the economic growth by the year 2030 in terms of meeting the global oil demand.² Keeping in mind the substantial benefits to the society due to its utility, the global demands have to be met.

PRODUCTION AND MANUFACTURING

The laws governing the production and manufacturing of petrochemicals in India have been summarised hereunder:

² *Petrochemicals set to be the largest driver of world oil demand*, IEA (Oct. 5, 2018), https://www.iea.org/ news/petrochemicals-set-to-be-the-largest-driver-of-world-oil-demand-latest-iea-analysis-finds.



¹ *About Petrochemicals*, DEPARTMENT OF CHEMICALS AND PETROCHEMICALS, https://chemicals.gov.in/ petrochemicals#policy (last visited Dec. 26, 2020).

Petroleum Act, Rules and Regulations

The Petroleum Act, 1934

The Petroleum Act, 1934 was enacted to consolidate and amend the law relating to the import, transport, storage, production, refining and blending of petroleum. Chapter I of the Act lays down the standards to be followed in the production of petroleum and Chapter III lays down the penalties and procedures to be followed if petroleum is not produced as per the standards. Section 5 of the Act provides that the Central Government may make rules prescribing the conditions, subject to which petroleum may be produced, refined or blended; and also lays the power to regulate the removal of petroleum which has not satisfied the prescribed tests as laid down under Section 16 of the Act. Further, the Central Government may authorise any officer to enter the premise where petroleum is produced for conducting test by virtue of Section 14 of the Act.

The Petroleum Rules, 1976

The Petroleum Rules, 1976 were laid down by the Central Government pursuant to its powers under the Petroleum Act, 1934. It defined hazardous area under Rule 103 as an area having flash point below 650C or above 650C, if it is likely to be refined, blended, handled or stored above its flash point. Rule 105 mentions that the extent of hazardous area shall be mentioned in Schedule 4. The Rules have been amended thrice since 1976: *firstly*, by exercising powers under Rule 29(2) and (3) of the Petroleum Act, 1934, *then*, after passing of the Petroleum Rules in 2002 by the Central Government, the Rules were amended in the year 2011 and 2018.

Plastic Waste Management Rules, 2016

Rule 13 stipulates that a producer cannot begin with the production unless registration has been obtained from the State Pollution Control Board or the Pollution Control Committee of the Union Territory. An application for registration has to be made in Form I and even for renewal of registration, same process has to be followed but the manufacturer of plastic has to make an application in Form III. If the application is for the purpose of recycling or processing waste, it has to be made through Form II.

National Rubber Policy 2019

Rubber has a vast consumption in various sectors including the petrochemical sector and with the Rubber Act, 1947 industry has developed but its effect on environment needs to be tackled. Thus, the government came up with this Policy in 2019, which emphasizes on research to substitute conventional filters originating from petroleum sources in rubber compounding.

EXPORT AND IMPORT

It is important to consider import and export segment of the petrochemicals as they are the most actively consumed raw materials, with tremendous growth in demand and the ensuing inability of domestic supply to cater to the same, resulting in the Nation's dependence upon imports³. These exports and imports are regulated by the government and following are the important Rules, Acts and International Conventions dealing with the export and import of the petrochemicals. There are also other actions that are taken up for the protection of the domestic industry from other countries dumping their products. Several authorities are in place to keep a check on the import and export of various products.

The Petroleum Act, Rules and Regulations

As petrochemicals are the chemical products made from the raw materials of petroleum, it becomes important to also look at the Rules and Acts dealing with petroleum.

- 1. **The Petroleum Act, 1934** Chapter I of the Petroleum Act, 1934 lays down some provisions for import and export of petroleum. Section 3 of the Act provides that import of petroleum needs to be done by following the Rules laid down under Section 4. It specifies that the Central Government has power to make rules to regulate the import of petroleum, prescribe the places where the petroleum may or may not be imported and also, the period within which the licenses can be applied for.
- 2. **The Petroleum Rules**, **1976** These Rules provide that petroleum which can be stored without license is not allowed to be imported without license. The Rules further deal with importation in two parts, Importation by sea (Rule 16 to Rule 24) and importation by land (Rule 25 to Rule 27).
- 3. **Petroleum Rules**, **2002** Chapter II of the Rules deals with the importation of petroleum and it has been divided into three parts. Part I provides the same rules as were provided by the Petroleum Rules, 1976. Part II deals with importation by sea and part III with importation by land.

³ *Petrochemicals*, INDIANPETROCHEM, https://indianpetrochem.com/monthly-advisory/petrochemicals advisory (last visited May 29, 2020).

The Hazardous Waste (Management and Transboundary Movement) Rules, 2016

Rule 17 of the Rules defines hazardous waste as any waste which by reason of characteristics, such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment. Rules 11 and 18 give the definition of export and import of such hazardous substances. Chapter III and some provisions of Chapter VI deal with export and import of hazardous and other wastes. Rule 12 mandates to follow Schedule I, II and III for the lists of hazardous waste that may be allowed to import and export.

Schedule II read with Rule 12(3) lists the hazardous waste, of which import and export may be allowed with Prior Informed Consent and it includes certain petrochemicals such as benzene, hexachlorobenzene, ethylene and DDT. Schedule III as per the Annexure VIII of the Basel Convention provides the list of hazardous waste that is applicable for import and export with Prior Informed Consent. Schedule VI provides the list of hazardous and other wastes that are prohibited for import and under B3, it includes certain petrochemicals. Form 5 has to be applied by the applicant for the purpose of export and import.

The Manufacture, Storage and Import of Hazardous Chemical Rules and allied amendments

The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 - Rule 18 of the 1989 Rules deals with the import of hazardous chemicals and clause (1) of the same Rule specifies that these Rules would apply to the Part II of Schedule 1. The Schedule contains certain petrochemicals and they have been tabulated as below. Before importing any of the hazardous chemicals, the authorities need to be informed thirty days prior to such import. Also, any person importing the hazardous chemicals needs to keep a record of such chemicals imported as per Schedule 10.

Groups	Chemical	S No. (as per List in Part II of the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989)
Aromatic	Aniline	37
	Benzene	56

TABLE -	1
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	Styrene	583
	Toluene	628
Polymers	Ethylene	261
	Vinyl Chloride	672
Fibre Intermediaries	Acrylonitrile	12
Phenolic Ketones & Resins	Acetone	4
	Methyl isobutyl ketone	388
	Phenol	481
Methanol and Derivatives	Acetic Acid	2
	Ethyl acetate	247
	Formaldehyde	285
	Vinyl acetate monomer	670
Others	Isopropyl alcohol	334
	Phthalic anhydride	508

The Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules, 1994 - Clause 3A was inserted in Rule 18 vide this Amendment which now empowers the authorities to stop the import of hazardous chemicals which threaten the safety or environmental considerations.

The Plastic Waste Management Rules, 2016

The Plastic Waste Management Rules, 2016 superceded the Plastic Waste (Management and Handling) Rules, 2011 in order to make the Rules more effective. Rule 4 puts certain conditions on the importer with respect to the use of carry bags, plastic sheets or the cover made of plastic. Rule 4(i) specifically restricts the use of certain polymers (one of the petrochemical) for packing *guthka*, *panmasala* and tobacco in any form. Further, Rule 9 puts a responsibility upon the importer for collecting back the plastic waste generated due to their products. In the Form II, the importer has to provide the details of the plastic waste to be brought in through import.

PACKAGING AND LABELLING

The following Rules apply to the petrochemical sector with respect to packaging and labelling:



The Hazardous Waste (Management & Transboundary Movement) Rules, 2016

Chapter V of the Act deals with packaging, labelling and transport of hazardous and other wastes. It provides under Rule 17 that whoever is dealing with the hazardous waste has to ensure that packaging is done in a manner that is suitable for safe storage, handling and transport. Form 8 read with Rule 17 (1) further lays down that the words 'HAZARDOUS WASTE' and 'HANDLE WITH CARE' should be prominent on the products and written in red in Hindi, English and other vernacular languages. Moreover, such label should be non-washable and weather proof. Also, the Central Pollution Control Board is empowered to make rules in this regard.

The Plastic Waste Management Rules, 2016

Rules 11, 12 and 14 of the Plastic Waste Management Rules, 2016 deal with the packaging and labelling aspect of plastic. Rule 11 specifies that certain information should be printed in English on the plastic bag, such as name, registration number of the manufacturer and thickness in case of a carry bag, etc. If a bag is recycled or made from compostable plastics, it needs to bear the label as 'recycled' or 'compostable'. In both cases of recycle or compostable plastics, the guidelines have to be followed as laid down by Indian Standards. Rule 12 provides that the State Pollution Control Board, Pollution Control Committee, Secretary-in-charge of Urban Development, Gram Panchayat are the relevant authorities responsible for the enforcement of provisions related to packaging. Further, retailers and street vendors have a responsibility to not sell the commodities to consumers in plastic bags or sheets which are not marked or labelled as per the prescribed rules and if they sell in such bags, they would be liable to pay fines. In light of the public interest litigation in Ankur Gutkha v. India Asthma *Centre*.⁴ MoEF issued a guideline vide Notification No. 11-9/2010-HSMD that the manufactures have to stop the usage of vinyl acetate, maleic acid and vinyl chloride copolymer for packaging of *Guthka*, Tobacco and *Pan masala* and in all forms.

The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989

Rule 17 provides that every container carrying hazardous chemicals needs to be clearly labelled and should carry an identification mark, which includes contents, name & address of the manufacturer or the importer and the physical, chemical and

⁴ Ankur Gutkha v. India Asthma Centre, Unreported Judgements, SLP 16308/2007 (SC).

toxicological data. It also provides for situations where it is impracticable to label. In aforementioned cases, other effective means have to be employed like tagging or adding accompanying documents.

Standards as laid down by Bureau of Indian Standards for Synthetic detergent

Synthetic detergent is one of the petrochemical products and includes several petrochemicals such as benzene. Schedule S of the Drugs and Cosmetics Act, 1945 states that the cosmetics under the Schedule have to conform to the Indian standard specifications and the list includes several synthetic detergent-based products such as shampoo and soap.

The Bureau of Indian Standards under the specifications for synthetic detergents for washing woollen and silk fabrics has laid down marking and labelling guidelines. It provides that for the ECO mark, the product needs to be packed in packages made from recyclable or biodegradable materials and needs to be accompanied with detailed instructions for proper use. Also, it needs to be marked with information such as month and year of the manufacture, a caution remark and the standard mark which is governed by the Bureau of Indian Standards Act, 1986.

TRANSPORT AND STORAGE

The Rules that apply to the transport and storage of other chemical sectors also apply to the petrochemical sector, as discussed in the previous chapters. Some of these Rules have been briefly discussed hereunder.

The Hazardous Waste (Management & Transboundary Movement) Rules, 2016

The Rules have defined transport as 'off-site' movement of hazardous or other wastes by air, rail, road or water and storage as storing any hazardous or other waste for a temporary period at the end of which such waste is processed or disposed of. Rule 18 provides that the transport of such waste shall be dealt with according to the provisions of these Rules, rules made by Central government under the Motor Vehicles Act, 1988 and guidelines as issued by Central Pollution Control Board.

Rule 4 states that for the purpose of transportation, the provisions of these Rules would be applicable and it is the responsibility of the occupier who wants to get their

waste treated or stored to provide specific information for safe storage and disposal. It is necessary to get authorization by making an application to State Pollution Control Board in Form 1 to engage in storage or transportation of the hazardous waste. The State Pollution Control Board can also cancel or suspend such license if the holder of authorization has failed to comply with the provisions of the Act or these Rules. Rule 8 deals with the storage of hazardous and other wastes and it provides that the occupiers can store but not for the period exceeding ninety days and such period can be extended by SPCB in certain cases, as mentioned in Proviso (i) to (v) to Rule 8. The storage has to be carried out as per the guidelines laid down by the SPCB. The occupier has certain responsibilities with regards to transportation, they have to provide the relevant information regarding the nature of hazardous waste and the measures to be taken in case of emergency as in Form 9 and also has to label the hazardous waste as per Form 8. The Manifest System has to be followed as per Rule 19 in order to carry on transportation. It consists of colour coding, which indicates the purpose of transportation, for instance, Copy 1 white colour indicates that it is to be forwarded to the SPCB. No transporter is allowed to accept the waste until it is accompanied by such copies. Moreover, if any accident occurs while transporting, it has to be immediately reported to SPCB as per Rule 22.

The Motor Vehicle Act, 1988

Rule 78 of the Act provides that while granting a goods carriage permit by the regional transport authority, the nature of chemicals that are to be carried has to be considered to ensure the safety of human life.

The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989

The Rules in Schedule 1 Part 2 list the hazardous and toxic chemicals and include certain petrochemicals such as acetone, benzene, ethylene, etc. They provide the provisions for the storage of chemicals. Rule 4(b) was substituted by Rule 3(i) of the Manufacture, Storage and Import of Hazardous Chemical (Amendment) Rules 1994, notified vide S.O 2882, which states that the isolated storage of a hazardous chemical as listed in Schedule 2 has to be in a quantity equal or more than the threshold quantity as specified in Column 3. To such isolated storage, Rules 7 to 15 apply as per Rule 6.

The Plastic Waste Management Rules, 2016

The Rules clearly state that the local body is responsible for the purpose of transportation and storage of the plastic waste. Rule 7 provides that in the rural areas, it shall be the Gram Panchayat which is responsible for ensuring that: people undertaking the storage and transportation have valid registration and cause no damage to the environment during such process; awareness is created among all stakeholders about their responsibilities' and open burning of plastic does not happen.

DISPOSAL AND WASTE MANAGEMENT

With respect to disposal and waste management of the petrochemical sector, in addition to other rules that apply to the other sectors discussed in the preceding chapters, the Petroleum Rules and the Plastic Waste Management Rules play a significant role in prescribing standards. Some of the Rules applicable have been briefly discussed.

The Petroleum Rules, 1976

Rule 170 of the Petroleum Rules, 1976 provides that for the purpose of drainage, all adequate arrangements have to be made and all the chemical waste has to be rendered harmless before it leaves the refinery area and the drains responsible for carrying the waste chemicals are to be such as not to be affected by the chemicals in question.

The Petroleum Rules, 2002

The Petroleum Rules, 2002 carry the same rules for disposal of petrochemical waste as given under the Petroleum Rules, 1976 with the only difference that the latter provides for these rules under Rule 170 and the 2002 Rules under Rule 169.

The Hazardous Waste (Management and Transboundary Movement) Rules, 2016

The Hazardous Waste Rules, 2016 define both the terms of disposal and waste under Rule 3 (10) and (38). Chapter II and Chapter IV of the Rules deal with the disposal and management of the hazardous waste. Chapter II lays down the procedure for management of hazardous and other wastes. It describes the responsibility of various stakeholders, from the occupier to the state government and the State Pollution Control Board. The responsibilities include sound management of the wastes, so that environment is not affected. The Rules also outline that it is the responsibility of the State Pollution Control Board to grant authorisation to the occupiers to manage such wastes through the application procedure as given in Form 1. Also, the Ministry of Environment and Forest has the authority to issue guidelines for environmentally sound management of the wastes as provided by Rule 10. Chapter IV deals with the treatment, storage and disposal facility for the hazardous and other wastes. Further, it is the responsibility of the operator of a common facility to maintain records of hazardous and other wastes as per Form 3.

The Plastic Waste Management Rules, 2016

Plastics are one of the products of petrochemicals and are used in varied forms such as polyethylene and polypropylene. It is an undeniable fact that plastic is the worst pollutant causing damage to the environment.⁵ The image below shows how plastics can be recycled through chemical recycling.



Evolving the Plastic Recycling Supply Chain

Figure 1: Plastic recycling supply chain

These Rules have given the responsibility of plastic waste management to the local bodies, Gram Panchayats, waste generators and the ones dealing with it as the producers, importers and brand owners. The responsibilities include ensuring the segregation and disposal of plastic waste, creating awareness among the stakeholders, ensuring that open burning of plastic does not take place, etc. Under Rule 8, it is the

⁵ *The Future of Petrochemicals*, IEA, https://www.iea.org/reports/the-future-of-petrochemicals (last visited May 30, 2020).

duty of the waste generator to take steps to minimise the generation of plastic waste and segregate it as per Solid Waste Management Rules, **2000**.

BANNED CHEMICALS IN INDIA

The Government of India banned the import of petcoke⁶ and furnace oil⁷ for use as fuel. As per the reports⁸ of the Indian Institute of Technology, Kanpur, sources of pollution during winter in Delhi include secondary particles (25-30%), vehicles (17-26%) etc., among various other pollutants, which include biomass burning, solid waste burning etc. The emission of Sulphur Dioxide by petcoke and furnace oil is high. That apart, total secondary sulphate particulate contribution in ambient PM10 concentration in Delhi is very high, being 4.5-15.3% during the winters and as high as 7% during the summers. Prior to this, the Supreme Court of India in M.C. Mehta v. Union of India & Others⁹ has been monitoring the issue of air pollution and on 24.10.2017, passed an order banning the use of Pet Coke and Furnace Oil in industries in the National Capital Region, Harvana, Uttar Pradesh and Rajasthan. Again on 17.11.2017, in the aforementioned writ petition, the Supreme Court noted that the issue of pollution caused by Pet coke and furnace oil is not restricted to the states which were considered at the earlier instance. Rather, it was an issue throughout the country and thereby, requested all the State Governments and Union Territories to consider taking similar measures as have been taken for NCR region. In continuation of this Order, the Central Pollution Control Board (CPCB) at the behest of Government of India, passed directions under Section 5 of the Environment Protection Act, 1986 in the aforementioned areas.

The Central Pollution Control Board has issued directions under Section 5 of the Environment (Protection) Act, 1986, regarding preparation of a policy outlining the use of Pet coke and Furnace Oil. The directions issued by the CPCB note that the rising pollution is a matter of serious concern, especially high levels of particulate matter exceeding the National Ambient Air Quality Standards, 2009.¹⁰ Both the Pet

¹⁰ National Clean Air Programme, Ministry of Environment, Forest and Climate Change, Government of India (Dec. 31, 2018), http://moef.gov.in/wp-content/uploads/2019/05/NCAP_Report.pdf.



⁶ Petcoke is Petroleum Coke which is a by-product created when bitumen found in tar sands is refined into crude oil.

⁷ Furnace Oil or Fuel Oil is mainly residues from crude-oil distillation

⁸ Use of Pet Coke and Furnace Oil in Industries, Ministry of Environment, Forest and Climate Change (Dec. 22, 2017), https://pib.gov.in/PressReleseDetail.aspx?PRID=1513890.

⁹ M.C. Mehta v. Union of India & Others, W.P No.13029/1985 (SC).

coke and Furnace Oil emit more Sulphur Dioxide (SO2) in comparison to the other conventional fuels and also contribute to secondary particulate matter in ambient air quality. The National Green Tribunal in its Order in *Sumit Kumar* v. *State of Himachal Pradesh & Others*¹¹ and *Amarjeet Kumar* v. *Union of India & Others*¹² had sent out mails to the State Governments seeking details of measures taken for banning the use of pet coke and furnace oil in their States as directed by the Supreme Court of India. The relevant Order also clearly specifies that Pet Coke and Furnace Oil can be used for the purpose of feedstock only.

CONCLUSION

India imports around 1.21 lakh crores of chemicals and petrochemicals annually.¹³ The rising import bills have been a cause of worry for the Government. That apart, the Government has also been aware of the various issues that may arise due to the usage of these chemicals from the perspective of environmental pollution and conservation. Despite there being numerous laws on the downstream and upstream sector of the conventional fuel industry, certain aspects of the pollution and its usage have been addressed under the Environment (Protection) Act, 1986. As has been focused in other Chapters, there are numerous chemicals which have been banned by the Government from either being manufactured, extracted, imported, exported and for other activities, necessary guidelines and prescriptions have been issued from time to time. Timely intervention by the Supreme Court of India, High Courts of various States and the recently established National Green Tribunal has resulted in passing of Orders regulating and prohibiting usage of hazardous chemicals in India. Despite there being numerous other chemicals requiring absolute prohibition from the Government, the necessary need for such prohibition has to be raised by the concerned stakeholders.

¹¹ Sumit Kumar v. State of Himachal Pradesh & Others, O.A. No.67/2019, Order dated 01.02.2019 (NGT).

¹² Amarjeet Kumar v. Union of India & Others, O.A. No.138/2019, Order dated 01.02.2019 (NGT).

¹³ Government looks to cut down imports of chemicals, make India manufacturing hub, The Economic TIMES (Aug. 21, 2019), https://economictimes.indiatimes.com/industry/indl-goods/svs/chem-/-fertilisers/government-looks-to-cut-down-imports-of-chemicals-make-india-manufacturing-hub/ articleshow/70774599.cms?from=mdr.



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