NATIONAL CHEMICAL MANAGEMENT PROFILE FOR INDIA

Prepared by

Ministry of Environment & Forests and Central Pollution Control Board

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- Alkali Manufacturers' Association of India (AMAI), Mumbai
- Bulk Drug Manufacturing Association (BDMA), Hyderabad
- Dyestuffs Manufacturers' Association of India (DMAI), Mumbai
- Gujarat Dye Stuff Manufacturing Association (GDMA)
- Pharmaceutical and Allied Manufacturers' Association (PAMDAL), Mumbai
- Organisation of Pharmaceutical Producers of India (OPPI), Mumbai
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EXECUTIVE SUMMARY

The Chemical industry is one of the oldest industries in India. It not only plays a crucial role in meeting the daily needs of the common man, but also contributes significantly towards the industrial and economic growth of the nation. The Indian chemical industries comprise small, medium and large-scale units. The chemical industry which includes basic chemicals and their intermediates, petrochemicals, fertilisers, paints, pesticides, bulk-drugs and pharmaceuticals is one of the most diversified industrial sectors covering more than 70,000 commercial products. While some chemical industries are knowledge based and small, others are large, requiring huge capital and interrupted power and other infrastructure for production. The chemical sector accounts for about 17.6% of the manufacturing sector output, 13 to 14% in total exports and 8-9% of total imports of the country. It contributes to about 3% of the GDP. During the last five years, exports of chemicals were higher than imports, thereby resulting in positive balance of trade as against the scenario during the nineties. Its contribution to the national revenue is about 18-20% of total collection by ways of various taxes. How far India is prepared with respect to chemical regulation in terms of risk reduction shall be the focal theme of this National Chemical Profile document.

In order to develop the National Chemical Profile, the National Chemical Coordination Committee decided to have three Working Groups to look into Legal, Technical and Infrastructure aspects for carrying out the groundwork with the help of available databases to be collected and collated by the Consultants. The Working Groups, thereafter, discussed and framed the database as per the guidelines of United Nations Institute for Training and Research (UNITAR).

It was decided that in first attempt, the sectors to be covered would be oil refineries, petrochemicals, fertilisers, pesticides, bulk drugs, dye & dye intermediates, paints, ink and printing ink, chlor-alkali and soda ash, which are the most organised sectors.

A careful analysis of database on production, import, export and uses, indicates that Indian chemical industries are mostly housed in Gujarat and Maharashtra with some nuclei at Andhra Pradesh, Tamil Nadu, Karnataka and West Bengal. Major users are located in Uttar Pradesh, Punjab and Haryana with respect to consumption of agrochemicals i.e. fertilisers and pesticides. But consumption of chemicals as a whole is low in India in comparison to advanced countries. India's own market is quite significant and growing rapidly with respect to chemicals, textiles, elastomers, polymers, ink and printing ink and bulk-drugs. However, owing to stagnation in the agriculture sector, there is a declining trend in the growth of agrochemicals. This is one of the reasons that production of agrochemicals is less than installed capacity. Bulk-drugs, dye and dye intermediates, petrochemicals are growing sectors in terms of export.

Inorganic chemicals such as chlor-alkali and soda ash have approached a steady and constant output level.

Since Gujarat and Maharashtra are the major chemical producing States, as expected, these are also the major hazardous waste generating States, followed by Andhra Pradesh, Karnataka and Tamilnadu. Initiatives have been taken in these States with respect to hazardous waste management by providing common facilities like secured landfill sites, installation of state-of-the-art incinerators and common effluent treatment plants for wastewater treatment, over and above individual facilities provided by large and medium industries.

Though major chemical clusters were identified by the Technical Working Group, there are a few hundreds of such clusters dotted around the country. Efforts have been made to control pollution in those clusters, particularly to arrest acute toxicity significantly so as to prevent contamination of surface water bodies by chemicals and ambient air by conventional pollutants. The major concerns and thrust areas of environmental pollution, at present, are hazardous waste handling, its storage and disposal and minimisation of volatile organic compounds, besides ensuring proper operation and maintenance of pollution control devices. The major draw back of chemical management is the insufficient database. There is a need for a well-organised database for chemical management. The thrust areas shall be ground water quality, chemical residue in food, public and occupational health, storage and disposal of obsolete chemicals, chemical poisoning and chemical accident during transportation. These databases need to be analysed with respect to risk assessment and risk reduction programmes on priority basis.

As for legislation, India is well placed. Almost, in all steps of chemical management from cradle to grave, legislation have been laid down. In such a large country like India with its diverse spectrum of chemical manufacturing and consumption, laying of legislation is not an easy task but it has been accomplished to a great extent due to the country's democratic and federal political structure. The most important aspect is that these wide spectrum of legislation are mutually exclusive and their overlapping is not significant.

Approximately 15 Acts and 19 Rules have been laid down for chemical management. These Acts, Rules and Regulations can be classified into following groups:

- Laws related to import and export
- Laws related to manufacturing of chemicals
- Laws related to transportation of chemicals
- Laws related to consumer's interest for using chemicals
- Laws related to protection of environment and public health

Acts, Rules & Regulation have been framed for each of above groups. However, the Environment (Protection) Act, 1986 serves as an umbrella Act and can link other Acts in one way or another, without interfering with the autonomy of any other Acts / Rules. Various Ministries at Central and State level with their regulatory agencies are responsible for implementing the respective laws. The Environment (Protection) Act, 1986 links the multilateral environmental agreements through various rules such as Hazardous Waste (Management and Handling) Rules, 1989 amended in 2000 and 2003 with the Basel Convention and Ozone Depleting Substances (Regulation and Control) Rules, 2000 with Montreal Protocol- in addition, it serves as an umbrella Act and can link other Acts in one way or another, without interfering with the autonomy of any other Acts / Rules. Since the Ministry of Environment & Forests is the nodal ministry for enforcement of the Environment (Protection) Act, 1986 and thereby the co-ordinating ministry for management of chemicals. The Ministries of Commerce and Finance take care of import and export. The Ministry of Health and Ministry of Agriculture with their concerned laws handle consumer interest. Ministry of Surface Transport and Ministry of Shipping ensure implementation of transportation laws. Labour Ministry is concerned with safety and occupational health and the Industry Ministry is concerned with use of explosives.

It is observed that some of ministries are predominantly regulators; others are a blend of developer, operator and regulator. With regard to effectiveness of implementation of laws, the factors considered are stated below:

- Effectiveness of coverage
- Inspection and vigilance
- Public awareness
- Procedure for obtaining information

On the basis of above stated factors, it is observed that implementation of legislation in India is ‘fair to effective’. The weakest factors are inspection, vigilance and public awareness. With respect to inspection and vigilance, the inherent limitation is lack of manpower and standardisation of procedures for inspection and vigilance. This can be over come by establishing standardised procedures for inspection and vigilance. Once these are established, private consultancy firms can be accredited for auditing and inspection, which will overcome the limitation of manpower. Moreover, India has a large number of research institutes, universities, industry associations, NGOs, labour unions and professional organisations. This vast resource can be utilised for activities like data collection, training & awareness and monitoring. While NGO’s and labour unions can be utilised for awareness to public and labour, R&D institutes can be utilised for data collection and monitoring and universities for development of organised manpower. Professional organisations and

industry associations can play a valuable role in policy framing, risk analysis and implementation of risk reduction programme.

It is observed that various ministries are involved in implementation of respective Acts and Rules related to chemicals management. It is, therefore, necessary to have more inter-ministerial commissions and coordination mechanisms. There are already various mechanisms in place such as a “Consultative Committee” has been constituted for dealing with issues on multilateral environment agreement on an international scenario and a “Central Crisis Group” has been established for the management of chemical accidents. Within the composition of regulatory agencies such as Central Insecticides Board and Central Pollution Control Board, the scope of consultation with other agencies/ ministries exists and is effectively utilised. The views from NGOs and Industry Associations are also considered by these Committees and Boards.

Perhaps the most important criteria for effective chemical management, is the availability of data and analysis of data. Many organisations are involved in collecting data- the database on pesticides, industrial chemicals and a chemical waste is encouraging- however, with respect to consumer chemicals, attention is needed. Database is not available for occupational health of workers in the agricultural sector. There is also a gap with respect to inventory of chemicals. Though multiple agencies are no doubt involved in the overall effort, synchronisation is needed. There is also a gap on poison statistics. Most of the databases are available officially except the import and export data, which have open access. International literature is available through the Internet.

Since the national data are available with concerned departments and agencies, there has been no major effort to harmonise the data collected by different agencies for data analysis purpose.

Existing databases are either in paper form kept in various files with concerned departments or in computers of particular departments. The National Informatics Centre (NIC) can play an important role in computerising the existing database of various government departments.

For the purpose of supporting programmes and policies for the management of chemicals, there are numerous institutes and laboratories spread over the country with varying capabilities. The laboratories are recognised by the following agencies:

- The Central Pollution Control Board under the Environment (Protection) Act, 1986

- The Ministry of Science and Technology, Council for Scientific and Industrial Research (CSIR)

- The Ministry of Agriculture (National level and State level Institutes, Bureaus, Project offices etc.)

- Bureau of Indian Standards (BIS)

- Central Board for Excise and Customs (Central Revenue Laboratories)

- Centre for Explosive Safety (CES), Ministry of Defence

- Ministry of Labour

- The National Accreditation Board for Laboratories (NABL)

- Laboratories are spread across the length and breadth of the country and there are no major regional imbalances requiring specific attention.

- Intra and inter laboratory Quality Assurance (QA) programmes are necessary to ensure precision and quality in the analysis undertaken. Laboratories even though recognised by the Government of India, should be advised strongly to go for NABL accreditation and other international accreditation for maintaining the standard. Reproducibility of results, error margins, accuracy and other precision topics needs to be addressed.

- Standard Reference chemicals are high cost materials and their availability is insufficient. A mechanism to ensure availability needs to be put into place.

- Analysis protocols are generally in place and these are widely available over the Internet. Laboratory grade analysis chemicals are available on demand.

- Environmental and chemicals management education is available across the country. However, additional modules on quality and precision control techniques may be introduced for laboratory chemists, technicians and other support services.

The participation and involvement in international agreements concerning management of chemicals is well developed in India. Most of the major international organisations such as the WHO, ILO, World Bank, UNIDO, FAO and others are working actively in India. There are well-defined procedures and structures to help in ensuring coordination between Ministries / Agencies and those responsible for health and safety activities. Depending upon the scope of activities, there is a designated ministry / agency to deal with international organisation. For example, Health Ministry is responsible for all activities related to WHO, Ministry of Labour for ILO, etc. The major international

programmes are International Programme of Chemical Safety (IPCS), Strategic Approach to International Chemicals Management (SAICM), International Register for Potentially Toxic Chemicals (IRPTC) and UNEP cleaner production programme. If the flow of information and management are improved, the implementation of international agreements will be more effective.

With respect to awareness & understanding of workers and the public, there are several legal provisions under the MSIHC Rules, Factories Act, Air Act, Water Act etc. The Central Pollution Control Board and the National Safety Council organise various courses on chemical safety, health and pollution control. The Ministry of Chemicals and Fertiliser also encourages training courses. In addition, various Non-Governmental bodies such ICMA, FICCI and CII also conduct training course on chemical management, safety, health and environment. The training programmes are designed for the personnel responsible for implementation of MSIHC Rules in the units, workers and public. It is now the right time to develop a training programme for professional capacity building. The subject “resources available and needed for chemical management” was not completed due to shortage of information with respect to technical and scientific staff and the State level and expenditure issues. This needs discussion before arriving at a correct figure.

Overall, it is observed that the India has the necessary legislation and infrastructure for implementing effectively chemical management in the country. What is needed is the availability of data and data analysis for evolving action plans and prioritisation. There is a limitation in terms of funds and manpower within the regulatory and government bodies. Therefore, it is advisable to tap the resources outside the government by accrediting / registering professional bodies and private laboratories. It is also necessary to standardise the inspection and audit procedures. Government may utilise various industry associations and NGOs for generation of data and ensuring availability of data. There is also a necessity for improvement in data analysis within the government and regulatory agencies. It is recommended that the National Coordination Committee continue for more time to build up overall policies, inter-ministerial linkages, international linkages, and programmes for successful chemical management.

ABBREVIATIONS

(P)	When appears next to year - indicates Provisional Values
2,4,5 -T	2,4,5 Trichlorophenoxyacetic acid
ABR	Acrylonitrile Butadiene Rubber
ABS	Acrylonitrile Butadiene Styrene
ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
AERB	Atomic Energy Regulatory Board
AICTE	All India Council for Technical Education
AIPIMA	All India Printing Ink Manufacturers' Association
AITUC	All India Trade Union Congress
AMAI	Alkali Manufacturers' Association of India
A&N	Andaman & Nicobar Islands
AP	Andhra Pradesh
APCTT	Asian and Pacific Centre for Transfer of Technology
AS	Ammonium Sulphate
AS&DC	Additional Secretary & Development Commissioner (of Small Scale Industries)
ASCI	Administrative Staff College of India
ASSOCHAM	Associated Chambers of Commerce
B.C.	Before Christ
BARC	Bhabha Atomic Research Centre
BCM	Billion Cubic Metre
BDMA	Bulk Drug Manufacturers' Association
BIS	Bureau of Indian Standards
BOD	Bio-chemical Oxygen Demand
C1	Hydrocarbons having single carbon atom
C4	Hydrocarbons having four carbon atoms
CA (EPPR)	Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
CABI	CAB International, UK
CAN	Calcium Ammonium Nitrate
CARI	Central Agricultural Research Institute
CAS	Country Assistance Strategy (of the World Bank)
CBEC	Central Board of Excise and Customs
CCG	Central Crisis Group
CCoE	Chief Controller of Explosives
CCPA	Canadian Chemical Producers' Association
CEES	Centre for Environment & Explosive Safety
CETP	Common Effluent Treatment Plant
CGIAR	Consultative Group on International Agricultural Research
CHEMEXCIL	Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council
CIB	Central Insecticides Board
CIBRC	Central Insecticides Board and Registration Committee
CIF	Chief Inspector of Factories
CII	Confederation of Indian Industry
CIMMYT	International Maize and Wheat Improvement Centre
CIP	International Potato Centre

CITU	Centre of Indian Trade Unions
CMVR	The Central Motor Vehicles' Rules, 1989
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board
CRCL	Central Revenue Control Laboratories
CREP	Corporate Responsibility for Environment Protection
CSE	Centre for Science and Environment
CSIR	Council for Scientific and Industrial Research
CWC	Chemical Weapons Convention
DAP	Di-Ammonium Phosphate
DARE	Department of Agricultural Research and Education
DC	District Collector
DCG	District Crisis Group
DDT	4,4 - Dichloro Diphenyl Trichloroethane
DGCA	Directorate General of Civil Aviation
DGCI&S	Director General of Commercial Intelligence and Statistics
DGD	Decision Guidance Documents
DG-FASLI	Director General, Factory Advice Services & Labour Institutes
DGFT	Director General of Foreign Trade
DGS&D	Directorate General of Supplies & Disposals
DISH	Directorate of Industrial Safety & Health
DM	District Magistrate
DMAI	Dyes Manufacturers' Association of India
DOF	Department of Fertilizers
DRDO	Defence Research & Development Organisation
DST	Department of Science & Technology
E(P) Act	Environment (Protection) Act
E(P) Rules	Environment (Protection) Rules
ECA	Essential Commodities Act
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EPTRI	Environment Protection, Training and Research Institute
ERF	Environment Relief Fund
ESCAP	Economic and Social Commission for Asia and the Pacific
FAI	Fertilizers Association of India
FAO	Food and Agriculture Organization
FCC	Fluidized Catalytic Cracking
FICCI	Federation of Indian Chambers of Commerce and Industry
FY	Financial Year (April to March)
GATT	General Agreement on Tariffs and Trade
GDMA	Gujarat Dyestuffs Manufacturers' Association
GDP	Gross Domestic Product
GINC	Global Information Network on Chemicals
GLP	Good Laboratory Practices
GOI	Government of India
GSFC	Gujarat State Fertilizer Corporation
HCEs	Health Care Establishments
HDPE	High Density Poly Ethylene
HMS	Hindustan Mazdoor Sangh

HPCL	Hindustan Petroleum Corporation Limited
HSMD	Hazardous Substances Management Division
http	Hyper Text Transfer Protocol
HW	Hazardous Waste
HW (M&H)	Hazardous Waste (Management & Handling) Rules, 1989 amended 2000 & 2003
IAMA	Indian Alkali Manufacturers' Association
IARI	Indian Agricultural Research Institute
IBP	Indo Burma Petroleum
ICAR	Indian Council of Agricultural Research
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICC	Indian Chemical Council
ICMA	Indian Chemical Manufacture Association
ICRA	Indian Credit Rating Agency
ICRAF	International Centre for Research in Agro Forestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDMA	Indian Drug Manufacturers' Association
IE/PAC	Industry & Environment - Programme Activity Centre
IFCS	Intergovernmental Forum on Chemical Safety
IISR	Indian Institute of Spices Research
IIT	Indian Institute of Technology
ILC	International Labour Conference
ILO	International Labour Organization
ILO CIS	International Occupational Safety & Health Information Centre of ILO
IMC	Inter Ministerial Committee
Indo-GTZ	German Organisation for Technical Collaboration
INR	Indian Rupees
INTUC	Indian National Trade Union Congress
IOCL	Indian Oil Corporation Limited
IOMC	Inter-Organisational Programme for the Sound Management of Chemicals
IPA	Indian Paints Association
IPCL	Indian Petrochemicals Limited
IPCS	International Programme on Chemical Safety
IPCS INTOX	A computerised package developed by IPCS for Poison Information System
IRPTC	International Register of Potentially Toxic Chemicals
IRRI	International Rice Research Institute
ISO	International Organization for Standardization
ISRS	International Safety Rating System
ISSPA	Indian Small Scale Paints Association
ITO	Income Tax Office (New Delhi)
ITRC	Industrial Toxicology Research Centre
J&K	Jammu & Kashmir
K	Potassium
K2O	Potassium Oxide
kg	Kilogram
km	Kilometre
Lac / lakh	Hundred thousand

LCG	Local Crisis Group
LDPE	Low Density Poly Ethylene
LLDPE	Linear Low Density Poly Ethylene
LPG	Liquefied Petroleum Gas
MAH	Major Accident Hazard
MEMC	Methoxy Ethyl Mercury Chloride
MoEF	Ministry of Environment & Forests
MOP	Muriate of Potassium
MOU	Memorandum of Understanding
MP	Madhya Pradesh
MS	Microsoft
MSDS	Material Safety Data Sheet
MSIHC	Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 amended 2000
MT / T	Metric Tonnes
N	Nitrogen
N.A.	Not Available
NAAQM	National Ambient Air Quality Monitoring
NABL	National Accreditation Board for Laboratories
NACA	Network of Aquaculture Centres in Asia-Pacific
NBPGR	National Bureau of Plant Genetic Resources
NCMP	National Chemicals Management Profile
NGL	Natural Gas Liquids
NGO	Non-Governmental Organisation
NH_3	Ammonia
NIC	National Informatics Centre
NIP	National Implementation Plan
NKP	Nitrogen, Potassium and Phosphorus - Fertilizer
NO2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NPPA	National Pharmaceutical Pricing Authority
NRCIPM	National Research Centre for Integrated Pest Management
NSDS	National Sustainable Development Strategy
NSIC	National Small Industries Corporation
O_3	Ozone
ODS	Ozone Depleting Substances
ODS (R&C)	Ozone Depleting Substances (Regulation and Control) Rules, 2000
OECD	Organisation for Economic Cooperation and Development
OHSAS	Occupational Health and Safety Assessment Series
OHSMS	Occupational Health and Safety Management System
ONGC	Oil and Natural Gas Corporation Ltd.
OPA	Office Procedure Automation
OPPI	Organization of Pharmaceutical Producers of India
P	Phosphorus
P_2O_5	Phosphorus Penta Oxide
PAMDAL	Pharmaceutical and Allied Manufacturers Association
PCBs	Poly Chlorinated Bi-phenyls
PCC	Pollution Control Committees (for Union Territories)
PGR	Plant Growth Regulators
PIC	Prior Informed Consent

PIL	Public Interest Litigation
POPs	Persistent Organic Pollutants
PWD	Public Works Department
QA	Quality Assurance
QMS	Quality Management System
RC	Registration Committee - for Pesticides
RNAM	Regional Network of Agricultural Machinery
RPS	Retention Price Scheme
Rs.	Indian Rupees
RSPM	Respirable Suspended Particulate Matter
SAARC	South Asian Association for Regional Cooperation
SAICM	Strategic Approach to International Chemicals Management
SAREC	Department of Research Cooperation of SIDA
SCAAP	Special Commonwealth African Assistance Programme
SCG	State Crisis Group
SHE	Safety, Health & Environment
SIDA	Swedish Agency for International Development Cooperation
SMPV	The Static and Mobile Pressure Vessel (Unfired) Rules, 1981
SO_2	Sulphur Dioxide
SO_x	Oxides of Sulphur
SPCB	State Pollution Control Board
SPM	Suspended Particulate Matter
Sq km	Square kilometre
SSI	Small Scale Industries
SSP	Single Super Phosphate
SSSBE	Small Scale Service Business Enterprises
STEL	Short Term Exposure Limit
STN	Scientific and Technical Information Network
TCA	Tri Chloro Acetic Acid
TDS	Total Dissolved Solids
TIFAC	Technology Information, Forecasting and Assessment Council
TN	Tamil Nadu
TPA	Tonnes Per Annum
TSDF	Treatment, Storage and Disposal Facility
TWA	Time Weighted Average
UDCT	University Department of Chemical Technology (Mumbai)
UK	United Kingdom
UN	United Nations
UNCED	United Nations Conference on Environment & Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
UNITAR	United Nations Institute for Training and Research
UP	Uttar Pradesh
US$	United States Dollar
USAID	United States Agency for International Development
USEPA	United States Environment Protection Agency
UT	Union Territory or Union Territories
w.r.t	with respect to
WARDA	Africa Rice Centre

WB	West Bengal
WHA	World Health Assembly
WHO	World Health Organization
WSSD	World Summit on Sustainable Development
WTO	World Trade Organisation
www	World Wide Web (Internet)

CONTENTS

CHAPTER 1

NATIONAL BACKGROUND INFORMATION

1.1 Physical and Demographic Context

1.1.1 Size

India is a vast country with diversity, which measures 3214 km from north to south and 2933 km from east to west with a total land area of 3,287,263 sq km. It has a land frontier of 15,200 km and a coastline of 7516.5 km. Andaman and Nicobar Islands in the Bay of Bengal and Lakshadweep in the Arabian Sea are parts of India.

1.1.2 Form of Government

The Constitution of India states India to be a sovereign, socialist, secular, democratic republic. It is a federal republic, with a bicameral parliament operating under a Westminster-style parliamentary system. It has a three-branch system of governance consisting of the legislature, executive and judiciary.

The President, who is the head of state, has a largely ceremonial role. His roles include interpreting the constitution, signing laws into action, and issuing pardons. He is also the Commander-in-Chief of the armed forces. The President and the Vice-President are elected indirectly by an electoral college for five-year terms. The Prime Minister is the head of government and most executive powers are vested in this office. He (or she) is elected by legislators of the political party, or coalition, commanding a parliamentary majority, and serves a five-year term incumbent upon enjoying this majority.

The legislature of India is the bicameral Parliament, which consists of the Upper House known as the *Rajya Sabha*, or Council of States, the Lower House known as the *Lok Sabha*, or House of the People, and the President. The 245-member *Rajya Sabha* is chosen indirectly through an electoral college and has a staggered six-year term. The 552-member *Lok Sabha* is directly elected for a five-year term, and is the determinative constituent of political power and government formation. All Indian citizens above the age of eighteen are eligible to vote.

The executive arm consists of the President, Vice-President and the Council of Ministers (the Cabinet) headed by the Prime Minister. Any minister holding a portfolio must be a member of either house of parliament. In India’s parliamentary system, the executive is subordinate to the legislature.

India's independent judiciary consists of the Supreme Court, headed by the Chief Justice of India. The Supreme Court has both original jurisdiction over disputes between States and the Centre, and appellate jurisdiction over the High Courts of India. There are eighteen appellate High Courts, having jurisdiction over a large State or a group of States. Each of these states has a tiered system of lower courts. A conflict between the legislature and the judiciary is referred to the President.

1.1.3 Official Languages

India has a diverse list of spoken languages among different groups of people. At least 30 different languages and around 2000 dialects have been identified. The Constitution of India has stipulated the usage of Hindi and English to be the two languages of official communication for the national government. Additionally, it contains a list of 22 scheduled languages. These languages are entitled to representation on the Official Language Commission, and a candidate in an examination conducted for national government service may opt to take the examination in any of these languages.

Official languages (Central administrative)

- ⇨ Hindi
- ⇨ English

Recognized national languages of India (Scheduled list for official use)

1. Assamese (official language of Assam)
2. Bengali (official language of Tripura and West Bengal)
3. Bodo (official language of Assam)
4. Dogri (official language of Jammu and Kashmir)
5. Gujarati (official language of Dadra and Nagar Haveli, Daman and Diu, and Gujarat)
6. Hindi (official language of Andaman and Nicobar Islands, Bihar, Chandigarh, Chattisgarh, Delhi, Haryana, Himachal Pradesh, Jharkhand, Madhya Pradesh, Rajasthan, Uttar Pradesh and Uttaranchal)
7. Kannada (official language of Karnataka)
8. Kashmiri
9. Konkani (official language of Goa)
10. Maithili (official language of Bihar)
11. Malayalam (official language of Kerala and Lakshadweep)
12. Manipuri (Meithei) (official language of Manipur)
13. Marathi (official language of Maharashtra)
14. Nepali (official language of Sikkim)
15. Oriya (official language of Orissa)
16. Punjabi (official language of Punjab)
17. Sanskrit

18. Santali
19. Sindhi
20. Tamil (official language of Tamil Nadu and Pondicherry)
21. Telugu (official language of Andhra Pradesh)
22. Urdu (official language of Jammu and Kashmir)

1.1.4 Local Languages

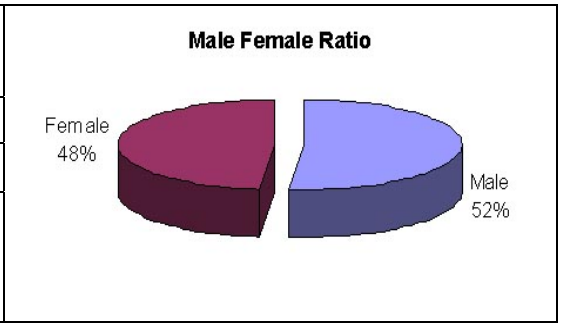
Other popular languages of India (over 5 million speakers but no official status):

1. Awadhi (often considered a sub-variety of Hindi)
2. Bhili (Bhil tribals)
3. Bhojpuri (language of Bihar, often considered a sub-variety of Hindi)
4. Bundeli (often considered a sub-variety of Hindi)
5. Chhattisgarhi (language of Chhattisgarh, often considered a sub-variety of Hindi)
6. Gondi (Gond tribals)
7. Haryanvi (language of Haryana, often considered a sub-variety of Hindi)
8. Hindustani A mixture of (Hindi and Urdu. This is spoken largely in the Northern part of India.)
9. Kanauji (language of Uttar Pradesh, often considered a sub-variety of Hindi)
10. Kodava, spoken in the Kodagu district of Karnataka
11. Kutchi (language of Kutch, a region in Gujarat)
12. Magahi (language of southern Bihar, often considered a sub-variety of Hindi)
13. Marwari (language of Rajasthan, often considered a sub-variety of Hindi)
14. Tulu (spoken by Tulu people of Karnataka and Kerala)

1.1.5 Total Population

India is the second most populous country in the world, with only China having a larger population. Language, religion, and caste are major determinants of social and political organisation within the highly diverse Indian population today.

Gender	Population (Million)	Literacy rate (%)
Males	532	75.3
Females	496	53.7
Total	**1028**	**64.8**



Source: *Census of India, 2001*

1.1.6 Urban Population

Total urban population is 27.78 % of the total population of the country. In the scheme of delineating rural and urban areas, all places where civic affairs are managed by an urban local body, like a Municipality, Corporation, a Cantonment or a Notified Area Committee, are automatically treated as urban areas and referred to as statutory towns. The villages or Panchayats satisfying the following criteria are also treated as urban areas:

i. a minimum expected population of 5,000
ii. a minimum population density of 400 persons per square kilometre
iii. at least 75% of the male working population should be engaged in non-agricultural pursuits

Such urban areas are referred to as census towns or non-statutory towns. Further, a village or part thereof, which is immediately adjacent to a town and has pronounced urban characteristics but does not qualify to be an independent town is treated as an outgrowth. An urban agglomeration is a continuous urban spread constituting a town and the adjoining urban out-growths or two or more physically contiguous towns together with the contiguous well recognized urban out-growths, if any, of such towns.

Towns are classified into six categories on the basis of population ranging from less than five thousand to 1 lac and above. The towns or agglomerations having population more than 1 lac (Class I) are referred to as cities. The million plus cities/urban agglomerations are referred to as metropolitan cities.

1.1.7 Rural Population

Total rural population is 72.22%.

1.1.8 Average Age of Population

India's median age is 24.66 years

1.1.9 Birth Rate

Birth rate per 1000 population is 25 births/year based on 2002 data of the Ministry of Health and Family Welfare and Office of the Registrar General of India.

1.1.10 Life Expectancy

Life expectancy at birth is 63.9 years for males and 66.9 years for females for a period of 2001 to 2006 (projected) based on data of the Ministry of Health and Family Welfare and Office of the Registrar General of India.

1.1.11 Percentage of Women Employed

Employment of women in the organized sector (both public and private) at end-March, 2003 is at 4.97 million, which constitutes 18.4 per cent of the total organized sector employment. *(**Source**: Ministry of Health & Family Welfare)*

1.2 Political / Geographic Structure of the Country

1.2.1 Number of Regions, States, Municipalities etc.

- Number of States 28
- Number of Union Territories 7
- Number of Districts 602
- Number of Tahsils / Talukas 3987
- Number of CD Blocks 5886
- Number of Statutory Towns 2987
- Number of Census Towns 1702
- Number of Inhabited Villages 587226
- Number of Uninhabited Villages 47095

Name of the States

1. Andhra Pradesh
2. Arunachal Pradesh
3. Assam
4. Bihar
5. Chhattisgarh
6. Goa
7. Gujarat
8. Haryana
9. Himachal Pradesh
10. Jammu and Kashmir
11. Jharkhand
12. Karnataka
13. Kerala
14. Madhya Pradesh
15. Maharashtra
16. Manipur
17. Meghalaya
18. Mizoram
19. Nagaland
20. Orissa
21. Punjab
22. Rajasthan
23. Sikkim
24. Tamil Nadu
25. Tripura
26. Uttarakhand
27. Uttar Pradesh
28. West Bengal

Name of the Union Territories

A	Andaman and Nicobar Islands	D	Daman and Diu
B	Chandigarh	E	Lakshadweep
C	Dadra and Nagar Haveli	F	Pondicherry

National Capital Territory

G Delhi

1.2.2 Description of Local Government Entities

India is divided into twenty-eight States (which are further subdivided into districts), six Union Territories and the National Capital Territory of Delhi. States have their own elected government, whereas Union Territories are governed by an Administrator appointed by the Union Government, though some have elected Governments. States are divided into districts and district administration is headed by a District Collector / Magistrate, who is appointed by the Government.

1.2.3 Division of Responsibilities between National, Regional, and Local Government in the Area of Environmental Protection

Ministry of Environment & Forests (MoEF), Government of India is the nodal Ministry for dealing with all the matters related to Environmental Protection in the country.

At the State level, Departments of Environment handle matters related to environmental protection.

In addition, at the Central level, Central Pollution Control Board is constituted to function at national level for control of pollution of air & water and to provide technical advice to MoEF. At the State / Union Territory levels, State Pollution Control Boards (SPCBs) / Pollution Control Committee (PCCs) are regulatory agencies in the area of pollution control as differentiated below:

Government Agencies

1. Central Government

- Ministry of Environment & Forests
- Central Pollution Control Board

2. State Governments / Union Territories

- State Department of Environment
- State Pollution Control Boards / Pollution Control Committees

1.3 Introduction to National Chemical Management Profile

The National Chemical Management Profile for India is prepared to provide comprehensive information about the chemicals in use, in the country. In order to develop the chemical profile, the National Chemical Coordination Committee was formed.

The National Chemical Coordination Committee constituted three separate working groups on legal, technical and infrastructure to carry out the basic studies including data collection. All ministries concerned with chemicals management, as well as relevant industries and public interest groups, are involved in the preparation of the National Chemical Management Profile for India. The report has been prepared in coordination with the three working groups. This report contains the technical information, i.e. inventory of chemicals in the country, which provides basic statistics about the quantity of chemicals in the identified sectors, in terms of their production, import, export and consumption and also the priority concerns related to them in the National Chemical Management Profile.

The following ten important chemical sectors, shown in **Table 1** were identified by the Technical Committee after several deliberations, since these are the most organized sectors and the chemicals identified form the building blocks for most of the chemicals in use, in the country.

Table 1: Chemical sectors identified for the study

S. No.	Chemical Sector	S. No.	Chemical Sector
1	Pesticides	6	Dyes & Dye Intermediates
2	Fertiliser	7	Chlor-Alkali
3	Oil Refineries	8	Soda Ash
4	Petrochemicals	9	Paint
5	Bulk Drugs	10	Ink & Printing Ink

Information in respect of above sectors was collected from the following government agencies / departments and trade associations:

Government Agencies / Departments

1. Ministry of Environment and Forests (MoEF), New Delhi
2. Ministry of Agriculture, New Delhi
3. Ministry of Petroleum & Natural Gas, New Delhi
4. Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilisers, New Delhi
5. Directorate General of Commercial Intelligence & Statistics, Ministry of Commerce (DGCI & S), Kolkata
6. Central Pollution Control Board (CPCB), New Delhi
7. Maharashtra Pollution Control Board (MPCB), Mumbai
8. Gujarat Pollution Control Board (GPCB), Gandhinagar
9. Andhra Pradesh Pollution Control Board (APPCB), Hyderabad
10. Central Insecticides Board, Faridabad
11. National Pharmaceutical Pricing Authority (NPPA), Ministry of Chemicals and Fertilisers, New Delhi

Trade Associations

1. Alkali Manufacturer's Association of India (AMAI), New Delhi
2. All India Printing Ink Manufacturer's Association (AIPIMA), Mumbai
3. Basic Chemicals, Pharmaceuticals and Cosmetics Export Promotion Council (CHEMEXCIL), Mumbai
4. Bulk Drug Manufacturing Association (BDMA), Hyderabad
5. Crop Care Federation of India (CCFI), New Delhi
6. Dyestuffs Manufacturers Association of India (DMAI), Mumbai
7. Fertilisers Association of India (FAI), New Delhi
8. Gujarat Dye Stuff Manufacturing Association (GDMA), Ahmedabad
9. Indian Chemical Manufacturer's Association (ICMA), Mumbai
10. Indian Drug Manufacturing Association (IDMA), Mumbai
11. Indian Paints Association (IPA), Kolkata
12. Organisation of Pharmaceutical Producers of India (OPPI), Mumbai
13. Pharmaceutical and Allied Manufacturer's Association (PAMDAL), Mumbai
14. Pharmaceuticals Export Promotion Council (PHARMEXCIL), Mumbai

CHAPTER 2

CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

The chemical industry, one of the oldest industries in India, is contributing significantly to industrial and economic growth of the country. The Chemical Industry in India, ranks 12th in the world in terms of volume. The industry's turnover is about USD 30 billion (2003-04), which is 14% of the total manufacturing output of the country. India is strong in basic chemicals, which are used in production of consumer items like paints, dyes, soaps, medicines, toiletries, cosmetics etc. The Indian Chemical Industry is consolidating and is increasingly becoming focused on product innovation, brand building and environmental friendliness. Even though India enjoys an abundant supply of some basic raw materials and natural resources, it will have to further build upon manufacturing facilities, technical services and marketing capabilities to face increasing global competition and to achieve better share of world market.

The Indian Chemical Industry owing to the wide spectrum of products manufactured and also due to the increasing development of new products has begun to pose a challenge in terms of the environment and health risks. The environmental concern and the health risks associated are particularly high in the covered sectors. India is also rapidly becoming a major CRAM (Contract Research and Manufacturing) base. The use of Material Safety Data Sheet (MSDS) for these new products is inadequate because of lack of training and awareness. In case of new products, the development of MSDS is not simultaneously done with the development of the new products. The Industry capacity to develop MSDS for new products also needs to be enhanced.

The wide and diverse spectrum of products manufactured by the chemical industry can be grouped into number of categories, such as inorganic chemicals, synthetic organic chemicals such as drugs and pharmaceuticals, dyes and intermediates, pigments, fine and specialty chemicals, pesticides, etc or basic industries such as petrochemicals, fertilisers, etc.

In terms of consumption, the chemical industry itself is its largest customer and accounts for approximately 33% of the total production. The basic chemicals are abundantly used in manufacture of various products. The consumer chemicals producing sectors are pharmaceuticals, cosmetics, household products, paints, etc. India also produces a large number of fine and specialty chemicals, which have very specific usage as food additives, pigments, polymer additives, anti-oxidants in the rubber industry etc.

The sector-wise details of chemical production, import, export and use are given below:

2.1 Pesticides

Pesticides include insecticides, fungicides, herbicides, weedicides, rodenticides and fumigants. Pesticides are first manufactured as technical grade products. The technical grade products are formulated with addition of various ingredients for final application. There are about 150 industrial units manufacturing pesticides (technical) and about 500 industrial units engaged in formulations in the country (**Source**: CPCB Publication).

2.1.1 Production

The Pesticide production has declined in recent years because of declining domestic consumption. Insecticides accounted for over 68% of the total production of pesticides in the year 2003-04.

The production capacity of various pesticides in India is given in **Table 2**.

Table 2: Installed capacities and production of various pesticides during 1993-94 and 2003-04

S. No.	Particulars	Installed capacity (thousand tonnes)		Average production (thousand tonnes)	
		1993-94#	2003-04*	1993-94#	2003-04*
1.	Insecticides	97.95	97.9	73.83	57.9
2.	Fungicides	6.90	21.1	5.52	19.4
3.	Herbicides	6.30	1.8	2.10	0.5
4.	Weedicides	3.40	9.7	2.84	5.1
5.	Rodenticide	0.90	3.2	0.50	1.4
6.	Fumigants	1.60	0.4	1.58	0.1
	Total	**117.05**	**134.1**	**86.37**	**84.3**

Source:

* *Annual report 2004-05, Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers*

\# *CPCB publications*

2.1.1.1 State-wise capacity & production

The state-wise capacity and production of pesticides in the year 2003-04 are summarised in the **Table 3**.

Table 3: State-wise installed capacity and production of pesticides during 2003-04

State	Installed (thousand tonnes)	Production (thousand tonnes)
Andhra Pradesh	3.4	2.655
Gujarat	72.682	36.048
Haryana	0.7	0.282
Karnataka	3.9	0.911
Kerala	4.594	2.467
Maharashtra	41.075	32.155
Punjab	0.06	0
Rajasthan	1.975	3.225
Uttar Pradesh	2.52	1.774
West Bengal	2.64	0.662

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals and Fertilisers, Government of India

It is observed from the **Table 3** that Gujarat and Maharashtra are the leading states with the highest installed capacity as well as production. The majority of the pesticides in the country are produced in these two states that together account for over 85% of the installed capacity as well as production.

2.1.2 Import

The imports of pesticides from the year 1999-00 to 2003-04 are summarized in **Table 4.** The imports constitute about 2.3% of the production during 2003-04.

Table 4: Import of Pesticides

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Pesticides (thousand tonnes)	0.5	0.6	1	0.6	2

Source: Annual Report, (2004-05), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

2.1.3 Export

The exports of pesticides from the year 1999-00 to 2003-04 are summarised in the **Table 5**. The pesticides exports have grown steadily and risen to constitute 23.7% of the total production in the year 2003-04.

Table 5: Exports of Pesticides

S. No.	Year	Pesticides (thousand tonnes)
1.	1999-00	15
2.	2000-01	14
3.	2001-02	13
4.	2002-03	17
5.	2003-04	20

Source: Annual Report, (2004-05), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

2.1.4 Use

The consumption of pesticides is given in **Table 6**. The consumption of pesticides has decreased over the years. In India, the consumption of insecticides account for over 76% of the production in the domestic market. (**Source**: 37th Report of Standing Committee on Petrochemicals and Chemicals)

Table 6: Use of Pesticides

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Consumption (Thousand Tonnes)	80.5	78.6	70	55.6	66.3

Source: Annual Report, (2004-2005), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

A lower trend of consumption of pesticides through out the country is observed during the year 2003-04. Punjab and Uttar Pradesh consumed more than 6000 tonnes (technical grade) of pesticides, while Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Rajasthan, West Bengal and Tamil Nadu consumed between 1000 tonnes to 4000 tonnes. Arunachal Pradesh, Bihar, Chattisgarh, Himachal Pradesh, Kerala, Orissa, Assam, Madhya Pradesh, Tripura and Uttaranchal consumed between 100 tonnes to 1000 tonnes and the rest below 100 tonnes. Consumption of pesticides in agriculture, public health and for household use was 41020 tonnes, 3687 tonnes and 330 tonnes respectively in the year 2003-04. (**Source**: Impact of pesticide use in India by H.N. Saiyed, V.K. Bhatnagar, Rekha Kashyap, India)

2.2 Fertiliser

Fertilisers include nitrogenous, phosphatic and complex fertilisers. Nitrogenous fertilisers include Urea, Ammonium Sulphate, Calcium Ammonium Nitrate and others. The phosphatic fertilisers include Single

Super Phosphate, Triple Super Phosphate and others. Complex fertilisers include Di-Ammonium Phosphate, Nitrogen - Phosphorus – Ammonium - Phosphate Sulphate (NP - APS) /Nitrogen Phosphorus Potassium (NPK) and others (Source: - Fertiliser Statistics 2003-04, The Fertiliser Association of India).

2.2.1 Production

Installed capacity and production of various types of fertilisers are summarised in **Table 7**. It is observed that nitrogenous fertilisers have more than 58.8% capacity and account for more than 66.7% of the total fertiliser production in the year 2003-04, while phosphatic and complex fertilisers have similar capacities though the production of complex fertilisers is more than that of phosphatic fertilisers.

Table 7: Installed Capacity and Production of Nitrogenous, Phosphatic and Complex Fertilisers

Year	Nitrogenous Fertilisers (thousand tonnes)		Phosphatic Fertilisers (thousand tonnes)		Complex Fertilisers (thousand tonnes)	
	Capacity	Production	Capacity	Production	Capacity	Production
2000-2001	35061.3	31508.9	13072.4	6476.4	11257.5	9467.6
2001-2002	35159.3	30529.5	11829.7	6341.9	12507.5	9807
2002-2003	34868.7	29925.4	11531.4	6289.3	12578	9932.5
2003-2004	34930.7	30414.7	11675.2	6099.9	12795.4	9065.7

Source: Fertiliser Statistics 2003-04, The Fertiliser Association of India

2.2.1.1 State-wise production of Fertilisers

The state-wise production of fertilisers is summarized in **Table 8.** It can be observed that nitrogenous fertiliser production is highest in Uttar Pradesh (about 27.3% of total nitrogenous fertiliser production) followed by Gujarat with about 18.3%. The production of phosphate fertilisers is highest in Gujarat at about 24.1% of total phosphate production with Andhra Pradesh second with about 11.3%. The production of complex fertilisers is highest in Gujarat (about 34.6% of total complex fertiliser production) with Andhra Pradesh second with about 15.9% of total complex fertiliser production.

It can be inferred that the state of Gujarat accounts for over 25.6% of the total fertiliser production of India followed by Andhra Pradesh that accounts

for over 11.3% of total fertiliser production of India. Uttar Pradesh produces over 10.8% of the total fertiliser production of India.

Table 8: State-wise production of Fertilisers during 2003-04

S. No.	State	Nitrogenous Fertiliser (thousand tonnes)	Phosphatic Fertiliser (thousand tonnes)	Complex Fertiliser (thousand tonnes)
1	Assam	289.4	-	-
2	Bihar	-	-	-
3	Jharkhand	36.4	-	-
4	Orissa	239.2	482.7	1219.7
5	West Bengal	119.1	674.6	583.1
6	Haryana	746.8	-	0
7	Punjab	1525.3	-	0
8	U.P.	8292.9	316.2	0
9	Andhra	2066.3	688.9	1443.5
10	Karnataka	506	65.7	92.7
11	Kerala	342.9	113.5	567.7
12	T.N.	1736.1	413.7	942.3
13	Gujarat	5579.4	1469.9	3136.2
14	M.P.	2488.1	498.5	0
15	Chhattisgarh	50.9	-	0
16	Maharashtra	2614.6	631.9	529.7
17	Rajasthan	3104.6	578.3	0
18	Goa	676.7	166.1	551.2

Source: Fertiliser Statistics 2003-04, The Fertiliser Association of India

2.2.2 Import

The year-wise import of fertilisers is summarised in **Table 9**. In the absence of commercially viable sources of potash in the country, the entire demand of potassium fertilisers for direct application is met through imports. The imports were about 12.1% of the production in the year 2003-04.

Table 9: Import of Fertilisers

Year	2000-01	2001-02	2002-03	2003-04
Import of Fertilisers (Thousand tonnes)	5792.2	6364.7	5030.8	5518.3

Source: Fertiliser Statistics 2003-04, The Fertiliser Association of India

2.2.3 Export

The export of fertilisers has been negligible (about 0.3%) as compared to the production in the Year 2003-04 and year-wise export is summarised in **Table 10**.

Table 10: Export of Fertilisers

Year	2000-01	2001-02	2002-03	2003-04
Export of Fertilisers (Thousand Tonnes)	106.31	24.55	39.64	126.02

Source: Fertiliser Statistics 2003-04, The Fertiliser Association of India

2.2.4 Use

The consumption of fertilisers is summarised in **Table 11**, which indicates that the consumption of fertilisers has remained more or less constant from the year 2000-01 to 2003-04. The fertiliser consumption is highest in Uttar Pradesh followed by Andhra Pradesh and Maharashtra.

Table 11: Consumption of Fertilisers

Year	2000-01	2001-02	2002-03	2003-04
Consumption (Thousand Tonnes)	53138.8	53018.6	51138.4	50972.6

Source: Fertiliser Statistics 2003-04, The Fertiliser Association of India

2.3 Oil Refineries

India is mainly dependant on imported crude oil. The domestic refining capacity as on 01-04-2004 was 127370 thousand tonnes per annum.

2.3.1 Production

The production of crude oil and petroleum products is covered separately in section 2.3.1.1 and 2.3.1.2.

2.3.1.1 Production of crude oil

The production of crude oil is summarised in the **Table 12**. It is observed in Table 2.11 that the production of crude oil increased by only 2.9% from 2000-01 to 2003-04. Offshore production accounted for over 65.6% of total crude oil production in the year 2003-04.

Table 12: Domestic Production of crude oil

Year	2000-01	2001-02	2002-03	2003-04
Onshore Production (Thousand Tonnes)	11791	11889	11472	11456
Offshore Production (Thousand Tonnes)	20635	20143	21572	21917
Total Crude Oil Production (Thousand Tonnes)	32426	32032	33044	33373

Presently, there are 18 Oil Refineries in India with 17 of them in the Public sector and 1 in the Private sector. Gujarat has two refineries which together account for over 36% of the refining capacity in India. Maharashtra, Tamil Nadu and Karnataka have 9.7%, 8.2% and 7.6% of the domestic refining capacity, respectively. The State of Assam that has the highest number of refineries (four) accounts for only 5.5% of the domestic refining capacity. The **Fig. 1** shows state-wise refining capacity.

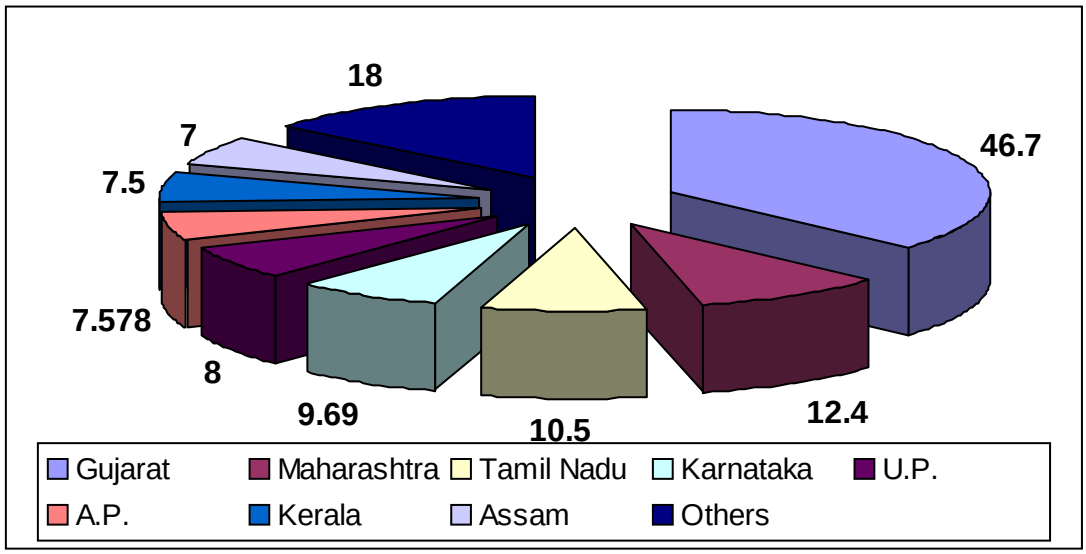


Fig 1: State-wise refining capacity

2.3.1.2 Production of petroleum products

The production of petroleum products is summarised in the **Table 13**. It is observed that the production of petroleum products has increased by 18.6% from 2000-01 to 2003-04.

The light distillates consist of Jet Fuel, Gasoline, Kerosene, Light Virgin Naphtha, Heavy Virgin Naphtha, Petroleum Ether, Petroleum Spirit, and Petroleum Naphtha. The middle distillates consist of Fuel Oil (grades 1 and 2), Diesel Fuel Oils (grades 1 and 2), Domestic Fuel, and Marine Gas Oil. The heavy ends consist of heavy crude oil, Fuel Oil No. 3 & 4, Fuel Oil No. 5 (Bunker B), Fuel Oil No. 6 (Bunker C), Marine Intermediate Fuel, and Marine Heavy Fuel.

Table 13: Production of petroleum products

Product	Year			
	2000-01	2001-02	2002-03	2003-04
Light Distillates (Thousand Tonnes)	25048	26539	28619	31971
Middle Distillates (Thousand Tonnes)	52445	54409	55937	60018
Heavy Ends (Thousand Tonnes)	18121	19056	19584	21474
Total	95614	100004	104140	113463

2.3.2 Import

Import of crude oil and petroleum products is summarised in **Table 14.**

Table 14: Import of Crude Oil and Petroleum products

Product	Year		
	2001-02	2002-03	2003-04
Crude Oil (Thousand Tonnes)	78706	81989	90434
Petroleum Products (Thousand Tonnes)	7009	6737	8001

Table 14 indicates that India depends greatly on the imports as far as crude oil is concerned. The high growth rate at which the economy is growing depends also on the constant supply of crude oil to meet the country's growing energy demand. The difference in the quantity of crude oil and petroleum products indicate that India has high refining capacity.

2.3.3 Export

The **Table 15** summarises the export of petroleum products. It can be observed that the exports have witnessed consistent growth. The exports have grown more than 45% in 2003-04 as compared to the exports in the year 2002-03.

Table 15: Export of Petroleum products

Product	Year		
	2001-02	**2002-03**	**2003-04**
Petroleum Products Exports (Thousand Tonnes)	10065	10289	14620

2.3.4 Use

The consumption of petroleum products is summarised in **Table 16**. It can be inferred that the consumption of petroleum products has increased by nearly 19% during 2003-04 as compared to 1998-99. It can also be observed that the consumption of light distillates is growing as compared to the other categories.

Table 16: Consumption of Petroleum products

Product	Year					
	1998-99	**1999-00**	**2000-01**	**2001-02**	**2002-03**	**2003-04**
Light Distillates (Thousand Tonnes)	20531	24531	29314	29618	31755	34099
Middle Distillates (Thousand Tonnes)	53330	55434	53467	51439	52065	52024
Heavy Ends (Thousand Tonnes)	16701	17121	17293	19375	20306	21628
Total Products (Thousand Tonnes)	90562	97086	100074	100432	104126	107751

2.4 Petrochemicals

The production of basic petrochemicals, intermediates and downstream petro-based products increased from 6500 thousand tonnes in 2002-03 to 7423 thousand tonnes in 2003-04, an increase of 14.2%. It has also grown sharply since 2003.

2.4.1 Production

The basic building blocks of petrochemicals can be broadly classified as olefins and aromatics. Major olefins include ethylene, propylene and butadiene. Major aromatic compounds include benzene, toluene and xylene. The installed capacity and production of major building blocks are summarised in **Table 17**, which indicates almost full utilisation of installed capacity of major building blocks. The building blocks are consumed in manufacture of downstream products viz. synthetic fibres, polymers, elastomers, synthetic detergent intermediates and performance plastics. The installed capacity and production of petrochemicals are summarised in **Table 17(a)** and **Table 17(b)**. Close examination indicates that production of propylene, polymers and synthetic detergents exceeds the installed capacity.

Table 17 (a): Installed capacity & production of petrochemicals (building blocks & aromatics) during 2003-04

Description	Ethylene	Propylene	Butadiene	Benzene	Toluene	Xylene
Installed (Thousand Tonnes)	2501	1541	139	686	280	204
Production (Thousand Tonnes)	2421	1746	114	608	165	207

***Source**:* Annual Report 2004-2005, Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

Table 17 (b): Installed capacity & production of petrochemicals during 2003-04

Description	Synthetic Fibres /Yarn	Polymers	Elastomers	Synthetic Detergent Intermediates	Performance Plastics
Installed (Thousand Tonnes)	2286	4449	147	426	115
Production (Thousand Tonnes)	1868	4499	87	453	99

Source: Annual Report 2004-2005, Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

2.4.1.1 State-wise capacity and production

There are 131 petrochemical plants in India out of which only 111 petrochemical plants are operational. Gujarat has 29 plants, out of which 23 plants are operational. Out of 26 plants in Maharashtra, only 23 are operational. In Uttar Pradesh, 10 plants are operational out of 15. The **Fig. 2** depicts the state-wise share in production of major petrochemicals during 2003-04. Three States i.e. Gujarat, Maharashtra and West Bengal together account for about 88% of the production of petrochemicals in the country.

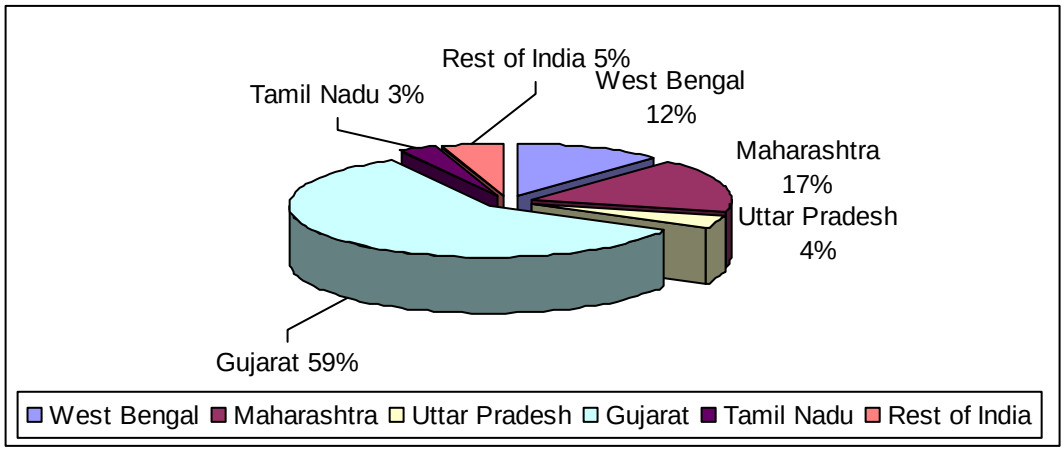


Fig 2: State-wise share in production of major petrochemicals

2.4.2 Import

The import of major petrochemical products is given in **Table 18**. It is observed that the imports of petrochemicals were about 11.9% of the total production in the year 2003-04. Import of Synthetic Fibres, Elastomers, Surfactants and Performance Plastics increased by 22%; 88%, and 520%, respectively in the year 2003-04 compare to 1999-00. India began import of surfactants (3000 tonnes) in 2003-04. Notably, the import of polymers has gone down by 15%.

Table 18: Import of major Petrochemicals (in thousand tonnes)

Year	Synthetic Fibers	Polymers	Elastomers	Surfactants	Performance Plastics
1999-00	127	545	95	0	5
2000-01	113	220	86	0	4
2001-02	147	420	99	0	3
2002-03	190	381	115	0	5
2003-04	155	462	179	3	31

Source: Annual Report, (2004-05), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

2.4.3 Export

The export of petrochemicals was over 14.8% of the total production in the year 2003-04. The export of Synthetic Fibres, Polymers, Elastomers and Surfactants has increased by about 31%, 713%, 700% and 62% respectively in the year 2003-04 compared to 1999-00. Performance Plastics, were exported in the year 2003-04. Export of major petrochemical products is summarised in **Table 19.**

Table 19: Export of major Petrochemicals

Year	Synthetic Fibres/ Yarn (thousand tonnes)	Polymers (thousand tonnes)	Elastomers (thousand tonnes)	Surfactants (thousand tonnes)	Performance Plastics (thousand tonnes)
1999-00	108	104	1	26	0
2000-01	134	368	1	41	0
2001-02	97	567	2	32	0
2002-03	144	761	8	56	0
2003-04	141	845	8	42	3

Source: Annual Report, (2004-05), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

2.4.4 Use

The consumption of major petrochemicals is given in **Table 20.** The consumption pattern shows that the consumption of major petrochemicals is steadily increasing.

Table 20: Consumption of major Petrochemicals

Year	Synthetic Fibres / Yarn (thousand tonnes)	Polymers (thousand tonnes)	Elastomers (thousand tonnes)	Surfactants (thousand tonnes)	Performance Plastics (thousand tonnes)
2000-01	1603	3318	162	384	75
2001-02	1717	3827	176	393	93
2002-03	1801	3795	188	391	100
2003-04	1882	4116	258	414	127

2.5 Bulk Drugs

In terms of value chain, the industry is divided into two categories: Bulk Drugs and Formulations.

2.5.1 Production

The production of bulk-drugs is shown in **Table 21**. It reveals that production increased by 18.2% from 2000-01 to 2003-04.

Table 21: Production of Bulk drugs

Year	2000-01	2001-02	2002-03	2003-04
Production (thousand tonnes)	18.73	19.86	22.13	22.14

Source: Annual Report (2001-2002 & 2004-2005), Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilisers

The bulk-drugs are divided into 21 major therapeutic classes. In India, the majority of the bulk-drugs produced are Anti-biotics constituting more than 50% of the total production. Analgesics and Antipyretics account for nearly 18% of the total production. Anti Dysentery and Vitamins constitute about 7-8% of the total bulk-drugs production. The therapeutic classes are given in **Table 22** along with the production and percentage share:

Table 22: Production of bulk drugs in terms of therapeutic class during 2003-04

S. No.	Therapeutic Class	Production (in tonnes)	Percentage of Total Production
1	Anaesthetics	52.08	0.2
2	Analgesics & Antipyretics	3954.23	17.9
3	Anti Asthmatics	310.60	1.4
4	Antibiotics	12115.77	54.7
5	Anti Diabetics	102.76	0.5
6	Anti Dysentery Drugs	1714.58	7.7
7	Anti Filarials	0	0.0
8	Anti Helmentics	52.17	0.2
9	Anti Histamines	39.83	0.2
10	Anti Leprotics	0	0.0
11	Anti Malarials	NA	-

S. No.	Therapeutic Class	Production (in tonnes)	Percentage of Total Production
12	Anti T. B. Drugs	908.00	4.1
13	Cardiovascular Drugs	8.10	0.0
14	CNS Stimulants	58.21	0.3
15	Corticosteroids	5.96	0.0
16	Diuretics	79.66	0.4
17	Gastro Intestinal	661.13	3.0
18	Other Anti Bacterials	433.30	2.0
19	Sulpha Drugs	5.96	0.0
20	Tranquilizers & Sedatives	15.32	0.1
21	Vitamins	1626.46	7.3

Source: Annual Report (2004-2005), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers

2.5.1.1 State-wise production of bulk-drugs

The **Fig. 3** depicts the state-wise distribution of the Bulk Drugs manufacturing industries. There are about 400 bulk-drugs manufacturing industries in the country with the majority of them located in Maharashtra, which accounts for more than 40%. The other two major states where Bulk Drugs industries are located are Andhra Pradesh and Gujarat.

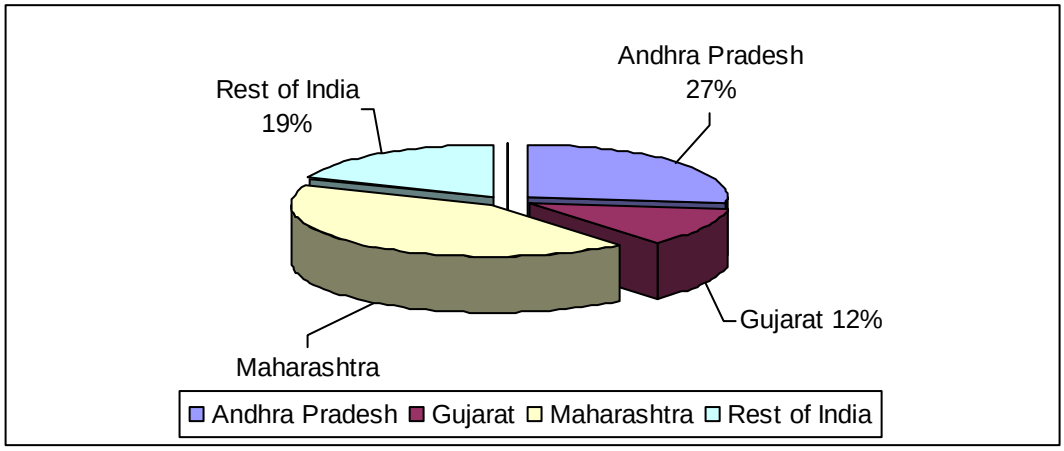


Fig 3: State-wise distribution of Bulk Drug manufacturing industries

2.5.2 Import

The import of drugs and pharmaceuticals is given in **Table 23**. The import of the drugs includes formulations (thereby inflating the figures for bulk-drugs). The country has large Contract Manufacturing Process (CMP) units. Such units import the raw materials *i.e.* bulk-drugs and process them

to an intermediate or finished form. Table 23 shows that the import of drugs and pharmaceuticals has increased by about 17% from 1999-00 to 2003-04.

Table 23: Import of Drugs and Pharmaceuticals

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Import (Thousand Tonnes)	1.237	1.756	2.565	1.5512	1.447

Source: DGCI&S, Kolkata

2.5.3 Export

The export of drugs and pharmaceuticals is given in **Table 24**. The export quantity includes the formulations and finished products of the CMP firms. But the export of formulation is far outweighed by the export of bulk-drugs intermediates and finished products manufactured from the local raw materials. Table 24 shows that exports have grown by more than 325% from 1999-00 to 2003-04.

Table 24: Export of Drugs and Pharmaceuticals

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Exports (000'Tonnes)	47.21	83.108	86.112	117.191	200.774

Source: DGCI&S, Kolkata

2.5.4 Use

The consumption of bulk-drugs was to the tune of 8.9 thousand tonnes in the year 2003-04. *(**Source**: International Trade Centre, Geneva)*.

2.6 Dyes & Dye Intermediates

The Dyes & Dye Intermediates sector is an important segment of the chemical industry in India, having forward and backward linkages with various sectors like textiles, leather, paper, plastics, printing ink and foodstuffs.

2.6.1 Production

The Dyes & Dye intermediate units are also one of the consumers of chemicals from the chemical industry. The units are mainly located in industrial estates of Gujarat and Maharashtra. Main consumers of its products are the textile industry, having a major presence in Gujarat and Maharashtra. The installed capacity and production of Dyes and Dye Intermediates are given in **Table 25**.

Table 25: Installed capacity and production of Dyes and Dye Intermediates

Year	95-96	96-97	97-98	98-99	99-00	00-01	01-02	02-03	03-04
Installed Capacity (Thousand tonnes)	49	50	56	56	59	48	49	49	54
Production (Thousand tonnes)	31	33	36	30	28	29	25	26	26

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals & Fertilisers, Govt. of India, Annual Report (2004-2005), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers

2.6.1.1 State-wise production of Dyes & Dye Intermediates

The states of Maharashtra and Gujarat are the largest manufacturers of Dyes and Dye Intermediates due to the presence of the raw material suppliers and customers. The state-wise production of Dyes and Dye Intermediates is given in **Fig. 4**.

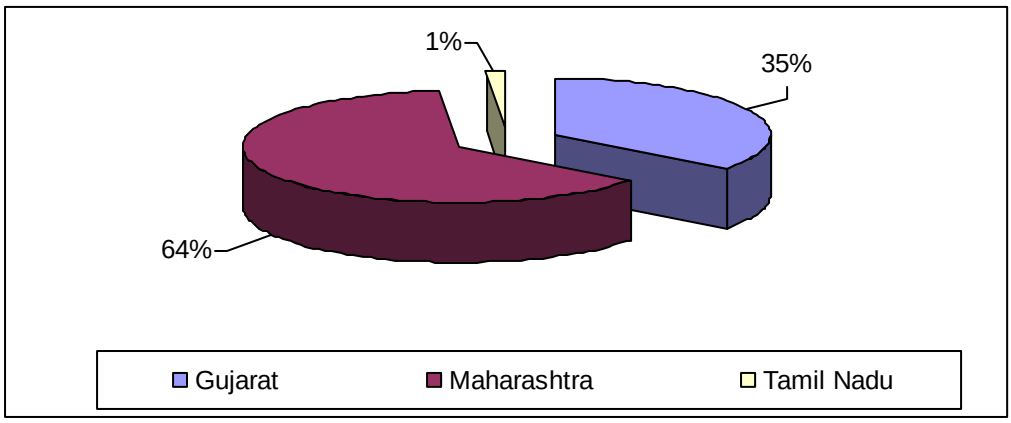


Fig 4: State-wise production of Dyes & Dye Intermediates

Source: Monitoring and Evaluation Division, Dept. of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers

2.6.2 Import

The **Table 26** provides the import figures from 1999-00 to the year 2003-04. The import of Dyes & Dye Intermediates accounts for 50% of the total production in the year 2003-04. It can be observed from Table 26 that the imports increased by 160% from 1999-00 to 2003-04.

Table 26: Import of Dyes & Dye Intermediates

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Import (Thousands Tonnes)	5	6	9	10	13

Source: Annual Report, (2004-05), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

2.6.3 Export

The **Table 27** provides the export figures from 1999-00 to the year 2003-04. The Table indicates that the exports of Dye & Dye Intermediates are increasing. It can be observed from Table 27 that the exports increased by more than 61.7 % from 1999-00 to 2003-04.

Table 27: Export of Dyes & Dye Intermediates

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Export (Thousands Tonnes)	81	100	100	122	131

Source: Annual Report, (2004-05), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

The data for use of Dyes & Dye intermediates is not given due to lack of reliable and accurate data.

2.7 Paints

There are about 30 paint manufacturing units in the large and medium scale sector and 2500 units in the small-scale sector. The large and medium and small-scale sectors have production share of 55% and 45%, respectively.

2.7.1 Production

The production of paints has been increasing over the years indicating growth in the consuming sectors such as housing, automotive, etc. The production details of paints are shown in **Table 28**.

Table 28: Production of Paints

Year	2000-01	2001-02	2002-03	2003-04
Production (Thousand Tonnes)	289.00	322.05	359.10	400.37

Note: Based on Industry Estimates

The paint sector is divided mainly into decorative and industrial coatings. The decorative coatings account for over 70% of the total paint production. The remaining 30% is contributed by the industrial coatings. The type-wise production of paints is depicted in **Fig.5**.

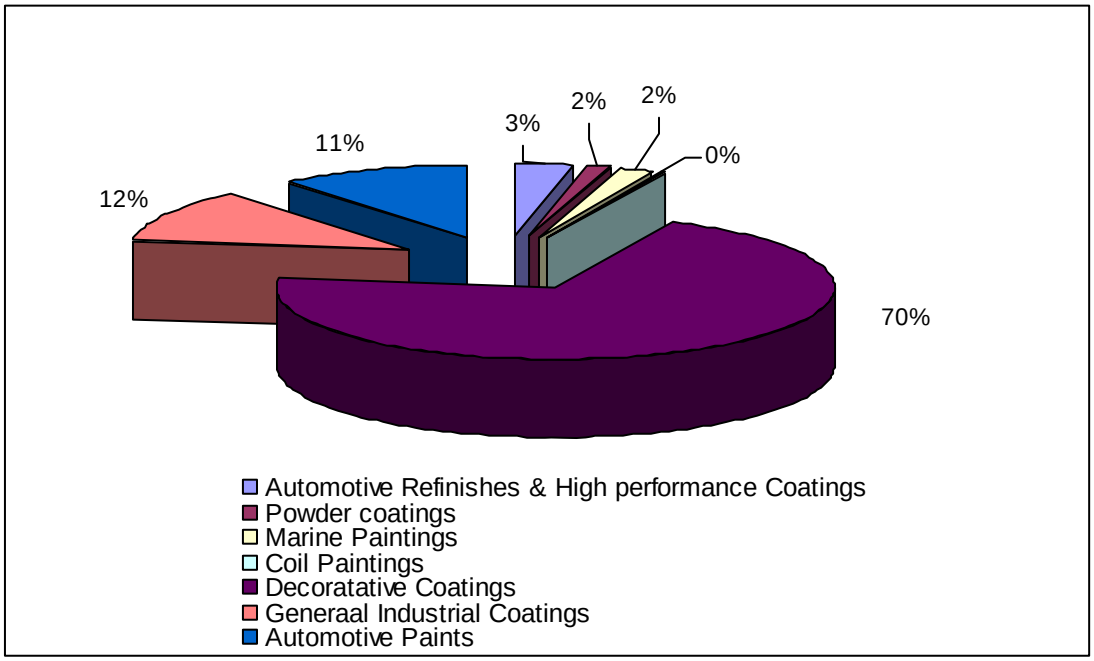


Fig. 5: Type-wise production of Paints

2.7.2 Import

The imports account for over 3% of the total production in the year 2003-04. The **Table 29** gives the statistics of import of paints. The Table shows that there has been very significant increase (384%) in import of paints from 1993-94 to 2003-04.

Table 29: Import of Paints

Year	1993-94	2003-04
Import (Thousand Tonnes)	2.587	12.521

Source: DGCI & S, Kolkata

2.7.3 Export

The exports account for about 2% of the production in the year 2003-04. The **Table 30** gives the statistics of export of paints. The Table indicates that there has been a steady increase (178%) in the export of paints, from 1993-94 to 2003-04.

Table 30: Export of Paints

Year	1993-94	2003-04
Exports (Thousand Tonnes)	2.864	7.961

Source: DGCI&S, Kolkata

2.7.4 Use

The consumption of paints in the year 2003-04 was 404.9 thousand tonnes.

2.8 Inks & Printing Inks

2.8.1 Production

The total production of Inks and Printing Inks was 112.06 thousand tonnes out of which Paste Ink accounted for 64.35 thousand tonnes, Liquid Ink 35.31 thousand tonnes, Industrial Coatings 6.05 thousand tonnes and Silk Screen 6.05 thousand tonnes in the year 2003-04. The installed capacity and production of Inks & Printing Inks are summarised in **Table 31**. It can be observed from Table 31 that almost the full installed capacity is utilised for production.

Table 31: Installed capacity and production of Inks & Printing Inks during 2003-04

Volume (Thousand tonnes)	Paste Ink	Liquid Ink	Silk Ink	Industrial Coating
Capacity	73.13	40.13	6.88	6.88
Production	64.35	35.31	6.05	6.05

Source: DGCI & S, Kolkata

2.8.2 Import

The import of Inks & Printing Inks accounts for over 3% of the total production in the year 2003-04. The **Table 32** provides the export figures in 1993-94 and 2003-04. The Table shows that there has been an increase of 677% in import of Inks & Printing Inks from 1993-94 to 2003-04.

Table 32: Import of Inks and Printing Inks

Year	1993-94	2003-04
Imports (Thousand tonnes)	0.4443	3.4535

Source: DGCI & S, Kolkata

2.8.3 Export

The export of Inks & Printing Inks accounted for over 19% of the total production in the year 2003-04. **Table 33** provides the export figures in 1993-94 and 2003-04. The Table shows that there has been huge increase in export of Inks & Printing Inks from 1993-94 to 2003-04.

Table 33: Export of Inks and Printing Inks

Year	1993-94	2003-04
Exports (Thousand tonnes)	0.65	21.741

Source: DGCI & S, Kolkata

2.8.4 Use

The consumption of Inks & Printing Inks was about 93.77 thousand tonnes in the year 2003-04. The consumption of various Inks & Printing Inks during 2003-04 is shown in **Table 34.** Major consumers of the Inks and Printing Inks are printing industries in addition to the paper industries.

Table 34: Consumption of Inks & Printing Inks during 2003-04

Description	Paste Ink	Liquid Ink	Silk Ink	Industrial Coating
Consumption (Thousand tonnes)	58.5	32.1	5.5	5.5

Source: Based on Industry Estimates

2.9 Chlor-Alkali

The main products of the Chlor-Alkali sector are Caustic Soda and Chlorine. This is one of the basic industrial sectors which have facilitated industrial growth in India.

2.9.1 Production

Chlor Alkali production reached to 2903 thousand tonnes in 2003-04 from 2194 thousand tonnes in 1999-00, with an overall increase of above 32%. The installed capacity and production of caustic soda and chlorine is given in **Table 35**.

Table 35: Installed capacity and production of Chlor-Alkali

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Installed Capacity (Thousand Tonnes)	3274	3430	3470	3439	3767
Production (Thousand Tonnes)	2194	2405	2512	2739	2903

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals & Fertilisers, Govt. of India, Annual Report (2004-2005), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

Production of Caustic soda and Liquid chlorine was 1749 thousand tonnes and 1154 thousand tonnes, respectively in 2003-04. The installed capacity & production of Caustic Soda & Liquid Chlorine are shown in **Table 36**.

Table 36: Installed capacity & production of Caustic Soda and Liquid Chlorine during 2003-04

Description	Caustic Soda	Liquid Chlorine
Installed Capacity (Thousand Tonnes)	2217	1550
Production (Thousand Tonnes)	1749	1154

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals & Fertilisers, Govt. of India

2.9.1.1 State-wise distribution of the caustic soda manufacturing industries

The state-wise distribution of caustic soda manufacturing industries is given in **Fig. 6.**

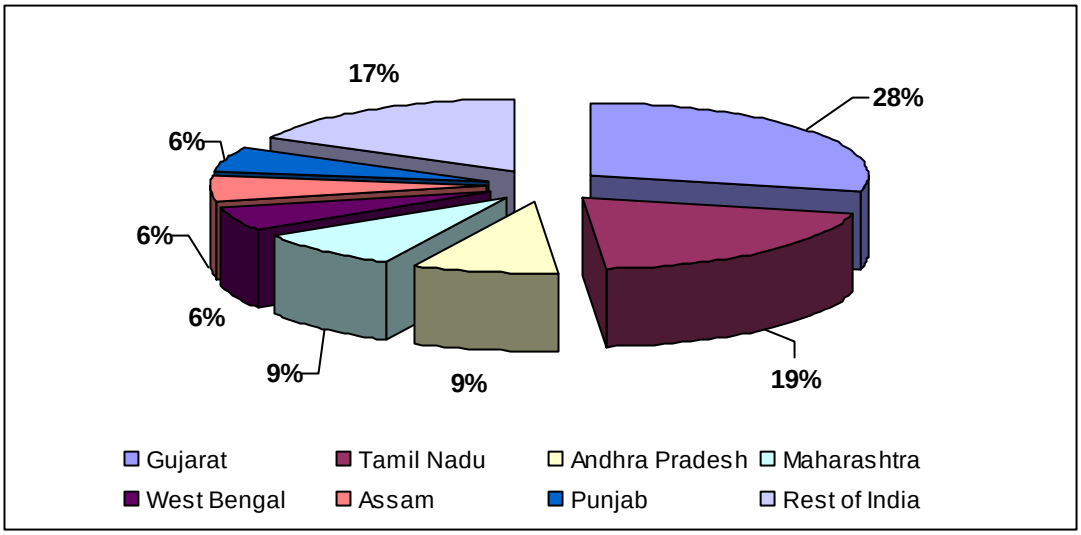


Fig.6: State-wise Caustic Soda manufacturing industries

The capacity of the caustic soda manufacturing units based on the membrane cell process was 1553.5 thousand metric tones as on 31-03-2005. The capacity of the mercury based manufacturing units was nearly 503 thousand metric tonnes. Out of a total of 35 caustic soda manufacturing units, 21 units employ membrane cell process, 11 units employ mercury based process and 2 units employ both the processes of manufacturing. The **Table 37** shows the state-wise numbers of the caustic soda manufacturing industries.

Table 37: State-wise Caustic Soda manufacturing industries

Sr. No.	State	Numbers of Caustic Soda Industries
1.	Gujarat	10
2.	Tamil Nadu	7
3.	Andhra Pradesh	3
4.	Maharashtra	3
5.	West Bengal	2
6.	Assam	2
7.	Punjab	2
8.	Jharkhand	1
9.	Karnataka	1
10.	Madhya Pradesh	1
11.	Orissa	1
12.	Rajasthan	1
13.	Uttar Pradesh	1

Source: Alkali Manufacturers Association of India

The Table 37 indicates that Gujarat has the maximum number of caustic soda manufacturing units followed by Tamil Nadu.

2.9.2 Import

The import of Caustic soda was 4.1% of the production for the year 2002-03. The import of Chlor-alkali from 1999-00 to 2003-04 is shown in **Table 38.**

Table 38: Import of Chlor-Alkali

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Caustic Soda (Thousnad Tonnes)	75.925	68.494	39.171	113.963	73.07
Liquid Chlorine (Thousnad Tonnes)	0.004	0.004	0.007	0.056	NA

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals & Fertilisers, Govt. of India, Alkali Manufacturers Association of India, New Delhi

2.9.3 Export

The export of Caustic soda was nearly 1.8 % of the production for the year 2003-04 respectively. The export of chlor-alkali from 1999-00 to 2003-04 is shown in **Table 39**. The Table shows that the exports of chlorine have increased significantly.

Table 39: Export of Chlor-Alkali

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Caustic Soda (Thousand Tonnes)	31.882	36.699	12.99	54.21	31.15
Liquid Chlorine (Thousand Tonnes)	1.237	3.339	6.276	17.33	NA

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals & Fertilisers, Govt. of India, Alkali Manufacturers Association of India, New Delhi

2.9.4 Use

Consumption of caustic soda for the year 2003-04 was 1791 thousand metric tonnes. **Table 40** shows that the consumption of Chlor-Alkali from 1999-00 to 2003-04. The Table 40 shows that the consumption of caustic soda and chlorine is increasing steadily.

Table 40: Consumption of Chlor-Alkali

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Caustic Soda Consumption (Thousand Tonnes)	1388	1545	1542	1659	1791
Liquid Chlorine Consumption (Thousand Tonnes)	848.8	887.7	905.7	1008	NA

Source: Basic Chemical Statistics at a Glance (2003-04), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Alkali Manufacturers' Association of India, New Delhi

The major consumers of liquid chlorine are the industrial sectors of pulp and paper, PVC, organic chemical, etc.

2.10 Soda Ash

Sodium carbonate, commercially known as soda ash, is a versatile inorganic chemical with a wide variety of applications in industry and domestic sectors. Soda ash industries in India have been operating for the last six to seven decades.

2.10.1 Production

The installed capacity and production of soda ash are given in **Table 41** Soda ash is predominantly produced in Gujarat, which accounts for more than 95% of the total production.

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Table 41: Installed capacity and production of Soda Ash

Year	2000-01	2001-02	2002-03	2003-04
Capacity (Thousand Tonnes)	1974	2049	2049	2626
Production (Thousand Tonnes)	1603	1505	1632	2167

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals & Fertilisers, Govt. of India, Annual Report, (2004-05), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

Over the last ten years (i.e. 1994-2004), growth in production of soda ash has been about 56%. The production of soda ash in the year 1994-95 and 2003-04 is given in **Table 42**.

Table 42: Production of Soda Ash in 1994-95 and 2003-04

Year	1994-95	2003-04
Production (Thousand Tonnes)	1394	2167

Source: Annual Report, (2004-05), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Govt. of India

2.10.2 Import

The Import of Soda Ash was about 5.9% in the year 2003-04. The import of soda ash from 1999-00 to 2003-04 is shown in **Table 43.** The import of soda ash has increased by 288.6% from the year 1999-00 to 2003-04.

Table 43: Import of Soda Ash

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Imports (Thousand Tonnes)	32.939	43.428	163.618	105.511	128

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals & Fertilisers, Govt. of India, Alkali Manufacturers Association of India, New Delhi

2.10.3 Export

The export of soda ash was about 12.6% of the total production in the year 2003-04. The export of soda ash from 1999-00 to 2003-04 is shown in **Table 44.** The export of soda ash during the year 2003-04 has witnessed an increase of more than 63% compared to previous year.

Table 44: Export of Soda Ash

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Exports (Thousand Tonnes)	40.411	97.625	87.461	167.571	274

Source: Basic Chemicals Statistics at a glance (2003-04), Ministry of Chemicals & Fertilisers, Govt. of India, Alkali Manufacturers Association of India, New Delhi

2.10.4 Use

Soda Ash is used extensively in various consumer industries, major proportion of which is consumed by the soap and detergent industry and the glass industry. Consumption in these two industrial units together account for over 65% of the total demand. In addition, it is used in other industries manufacturing Dyes and dye intermediates, industrial chemicals, paper etc. The consumption of Soda ash is given in **Table 45**.

Table 45: Consumption of Soda Ash

Year	1999-00	2000-01	2001-02	2002-03	2003-04
Consumption (Thousand Tonnes)	1619	1548	1582	1570	2092

Source: Basic Chemical Statistics at a Glance (2003-04), Department of Chemicals & Petrochemicals, Ministry of Chemicals & Fertilisers, Alkali Manufacturers' Association of India, New Delhi

The Table 45 shows that the consumption of soda ash has increased by 29.2%. The main consuming industries of soda ash are glass, detergent, laundry soap, sodium silicate, cotton yarn, dyes and dye intermediates, paperboard and other chemical industries.

Summary of Chapter # 2

The summary **Table 46** gives the overall view of the identified chemical sectors in terms of their installed capacity, production, import, export and consumption in the country.

Table 46: Summary of Identified Chemical Sectors (Installed capacity, Production, Export and Consumption)

Chemical Sector	Installed Capacity (Thousand Tonnes)		Production (Thousand Tonnes)		Import (Thousand Tonnes)		Export (Thousand Tonnes)		Consumption (Thousand Tonnes)	
Pesticides (**Source:** DGCI&S, States, UTs, Ministry of Chemicals & Fertilisers)	**134.1**		**84.35**		**2**		**20**		**66**	
	Insecticide	97.9	Insecticides	57.9						
	Fungicide	21.1	Fungicides	19.4						
	Herbicides	01.8	Herbicides	0.5						
	Fumigants	0.4	Fumigants	0.1						
	Weedicide	9.7	Weedicides	5.1						
	Rodenticide	3.2	Rodenticides	1.4						
Fertilisers (**Source:** The Fertiliser Association of India)	**59401.3**		**45580.3**		**5518.3**		**126.02**		**50972.6**	
Oil Refineries (Crude Oil & Petroleum Products) (**Source**: Ministry of Petroleum & Natural Gas)	**127370**		**113463**		**98435**		**14620**		**107751**	
			Light Distillates	31971						
			Middle Distillates	60018						
			Heavy Ends	21474						
Petrochemicals (Major Petrochemicals) (**Source**: Ministry of Chemicals & Fertilisers)	**7423**		**7006**		**830**		**1039**		**6797**	
	Synthetic Fibre	2286	Synthetic Fibre	1868	Synthetic Fibre	155	Synthetic Fibre	141	Synthetic Fibre	1882
	Polymer	4449	Polymer	4499	Polymer	462	Polymer	845	Polymer	4116
	Elastomers	147	Elastomers	87	Elastomers	179	Elastomer	8	Elastomers	258
	Surfactants	426	Surfactants	453	Surfactants	3	Surfactant	42	Surfactants	414
	Performance Plastics	115	Performance Plastics	99	Performance Plastics	31	Performance Plastics	3	Performance Plastics	127

Chemical Sector	Installed Capacity (Thousand Tonnes)	Production (Thousand Tonnes)		Import (Thousand Tonnes)	Export (Thousand Tonnes)	Consumption (Thousand Tonnes)
Bulk Drugs (**Source:** Ministry of Chemicals & Fertilisers)	**N.A.**	**22.14**		**1.447***	**200.774***	**8.9**
		Anaesthetics	0.052			
		Analgesics & Antipyretics	3.95			
		Anti Asthmatics	0.31			
		Antibiotics	12.12			
		Anti Diabetics	0.1			
		Anti Dysentery Drugs	1.71			
		Anti Filarials	0			
		Anti Helmentics	0.05			
		Anti Histamines	0.04			
		Anti Leprotics	0			
		Anti Malarials	NA			
		Anti T. B. Drugs	0.91			
		Cardiovascular Drugs	0.01			
		CNS Stimulants	0.06			
		Corticosteroids	0.01			
		Diuretics	0.08			
		Gastro Intestinal	0.66			
		Other Anti Bacterials	0.43			
		Sulpha Drugs	0.01			
		Tranquilizers & Sedatives	0.02			
		Vitamins	1.63			

Chemical Sector	Installed Capacity (Thousand Tonnes)	Production (Thousand Tonnes)		Import (Thousand Tonnes)	Export (Thousand Tonnes)	Consumption (Thousand Tonnes)
Dyes & Dye Intermediates (**Source**: Ministry of Chemicals & Fertilisers)	**54**	**26**		**13**	**131**	**-92**
Paints (**Source:** IPA,ISSPA)	**600**	**400.373**		**12.521**	**7.961**	**84**
Ink & Printing Ink	**127.02**	**112.06**		**3.45**	**21.741**	**101.6**
		Paste Ink	64.35			
		Liquid Ink	35.31			
		Silk Screen	6.05			
		Industrial Coatings	6.05			
Chlor Alkali (**Source**: AMAI, Ministry of Chemicals & Fertilisers)	**3767**	**2903**		**73**	**31.153**	**1791**
		Caustic Soda	1749			
		Liquid Chlorine	1154			
Soda Ash (**Source:** AMAI, Ministry of Chemicals & Fertilisers)	**2626**	**2167**		**128**	**274**	**2092**

Note: *The import & export data of bulk-drugs includes formulations.

The chemical industries are located in many clusters in India. The map showing various industrial clusters in India is given in **Fig 7.**

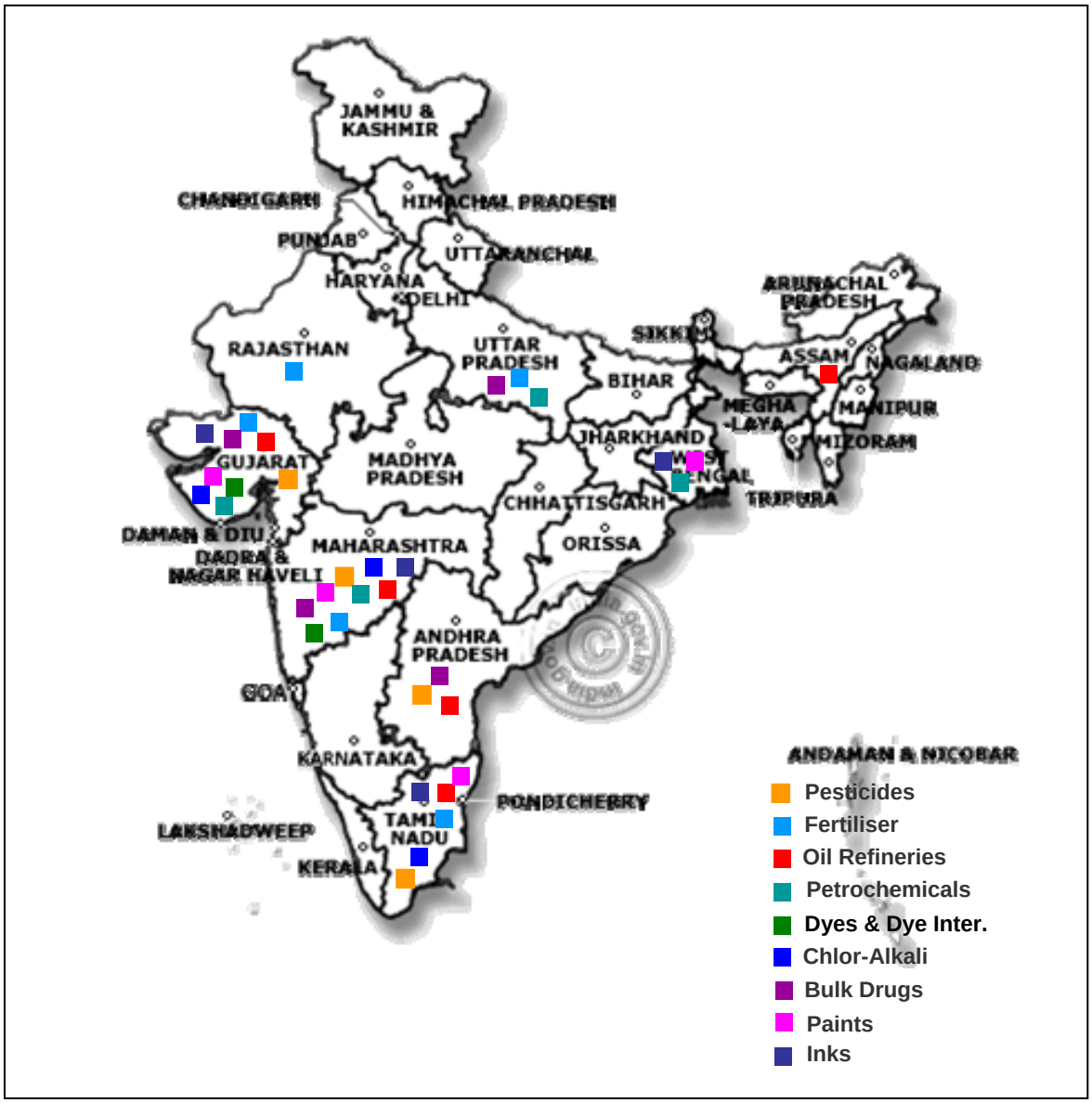


Fig 7 Concentration of major chemical clusters in India

Fig 7 shows that the major chemical clusters are mainly located in Maharashtra and Gujarat. The states have separate Industrial Development Corporations to facilitate the establishment of the industries in the respective states. Important chemical estates in different States are given in **Table 47**.

Table 47: Important chemical estates in different states of India

S. No.	State	Location of the Chemical Estate
1	Andhra Pradesh	Patancheru-Bollaram, Vishakhapatnam
2	Gujarat	Vatva, Nandesari, Vapi, Ankleshwar, Panoli
3	Kerala	Greater Cochin
4	Maharashtra	Chembur, Thane, Tarapur, Raigad, Mahad, Belapur
5	Orissa	Paradeep
6	Tamil Nadu	Cuddalore
7	West Bengal	Haldia

Major chemical clusters are in the States of Maharashtra, Gujarat, Andhra Pradesh and Tamil Nadu. The States of West Bengal, Kerala and Orissa also house chemical industrial estates. In Gujarat and Maharashtra, there are large numbers of chemical industrial estates manufacturing a wide variety of products.

The concentration of chemical production units in India is given in **Fig 8**, which indicates that Maharashtra and Gujarat account for over 84% of the production units.

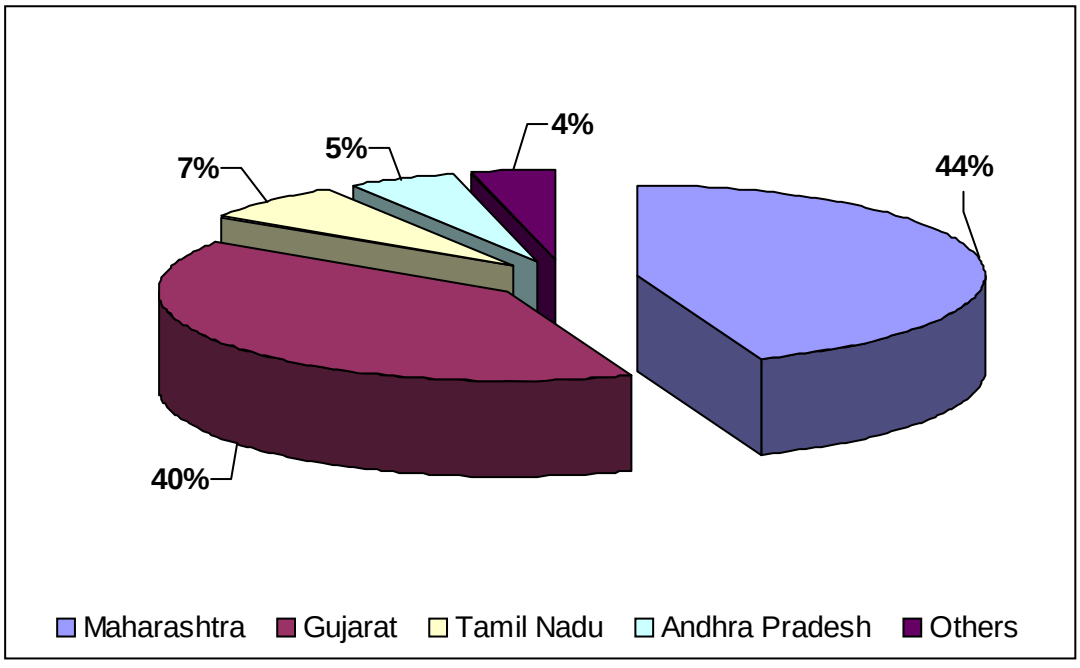


Fig 8: Concentration of Chemical Production Units

One of the major problems associated with the chemical manufacturing is generation of significant quantities of hazardous waste. The major generators of hazardous wastes are dyes & dye intermediates, bulk drugs, pesticides and

petrochemicals industries. Treatment and disposal of hazardous waste have gained momentum in the last decade. However, the issue of hazardous waste treatment and disposal has been addressed to a reasonable extent, only in the states of Maharashtra, Gujarat and Andhra Pradesh.

2.11 Chemical Waste (Hazardous)

2.11.1 Hazardous Waste Generation

Quantum of waste generation depends on various factors such as quantity and composition of the raw material, production process involved, treatment process adopted and operating condition.

The total amount of chemical waste produced by each of the 10 identified sectors could not be quantified as there is lack of segregated data. However, all these sectors are the major contributors of hazardous waste (**Source**: CPCB).

The **Table 48** summarises the State-wise hazardous waste generating industries identified as per Hazardous Waste (Management & Handling) Rules, 1989 as amended in 2003 (**Source**: CPCB).

Table 48: State-wise Hazardous Waste (HW) generating Industries and Hazardous Waste generation

S. No.	State	HW generating Industries (No's) as per HWM Rules, 2000/2003	Total HW generation in TPA
1	Andhra Pradesh	1532	507046
2	Assam	23	4000
3	Bihar	31	3182*
4	Chandigarh	271	8425
5	Delhi	1777	17000
6	Goa	49	9932*
7	Gujarat	6052	1207000
8	Haryana	889	14972
9	Himachal Pradesh	575	Not Provided
10	Karnataka	1589	92013
11	Kerala	423	83530
12	Maharashtra	4355	1407480
13	Madhya Pradesh	818	182590
14	Orissa	257	74918
15	J & K	Not Provided	Not Provided
16	Pondicherry	66	30320
17	Punjab	1448	15769

S. No.	State	HW generating Industries (No's) as per HWM Rules, 2000/2003	Total HW generation in TPA
18	Rajasthan	512	183737
19	Tamil Nadu	2177	181624
20	Uttar Pradesh	1633	82375
21	West Bengal	568	236449*
22	Chattisgarh	149	40216
23	Mizoram	Nil	Nil
24	Meghalaya	39	37412
25	Nagaland	Not Provided	Not Provided
26	Daman, Diu & DNH	598	30862*
27	Jharkhand	169	Not Provided
28	Uttaranchal	39	7514*
29	Manipur	Nil	-
30	Tripura	187	Not Provided
31	Lakshadweep	Nil	Nil
32	Arunachal Pradesh	Nil	Nil
33	Andaman & Nicobar Islands	Nil	Nil
34	Sikkim	Nil	Nil

Note: The data are based on the preliminary inventory carried out by the SPCBs / PCCs on HW generating units and the HW generation. Hence, the figures may vary, as per updation from time to time.

There are Common Treatment, Storage and Disposal Facilities (TSDF) in operation in a few States. Sector-specific hazardous wastes received by these facilities are given in **Table 49, Table 50** and **Table 51**. Close examination of these tables indicates that sector-specific hazardous wastes are increasingly received in these facilities.

Table 49: Hazardous wastes received at Hyderabad TSDF Site (Thousand Tonnes)

Industry	2001-02 (Sep-Mar)	2002-03 (Apr-Mar)	2003-04 (Sep-Mar)
Pesticides	0.98	4.89	5.03
Fertilizers	-	0.02	0.01
Bulk Drugs	8.4	24.83	35.56
Petrochemicals	0.0	0.00	0.091
Paints	0.94	1.28	0.41
Dye and Dye Intermediates	3.93	6.15	5.59
Chlor alkali	0.00	0.00	0.014

Table 50: Hazardous wastes received at Thane TSDF Site, Maharashtra

Industry	2004 (Thousand Tonnes)
Pesticides	0.85
Bulk Drugs	18.89
Petrochemicals	0.68
Paints	0.18
Dye and Dye Intermediates	56.79
Oil Refineries	0.33
Ink & Printing Ink	0.08

Table 51: Hazardous wastes received at Ankleshwar TSDF Site, Gujarat (Thousand Tonnes)

Sector	Year						
	97 - 98	98 - 99	99 - 00	00 - 01	01 - 02	02 - 03	03 – 04
Bulk Drugs	0.002	1.155	1.625	5.324	6.852	10.472	14.805
Dyes & Dye Inter	0.039	4.659	11.090	8.643	8.049	17.934	19.533
Organic	0.008	1.124	3.238	5.463	6.268	10.151	8.539
Inorganic including Chlor Alkali	0.009	2.716	3.245	6.302	8.282	3.369	6.805
Pesticides	0.167	9.149	14.211	15.100	12.939	15.031	17.018
Others	0.314	1.037	4.384	4.177	9.018	4.527	21.282
Total	0.539	19.841	37.794	45.010	51.407	61.485	87.983

CHAPTER 3

PRIORITY CONCERNS RELATED TO CHEMICAL PRODUCTION, IMPORT, EXPORT AND USE

3.1 Priority Concerns Related to Chemicals

The chemical sector is one of the very important industrial sectors for socio-economic growth in India and the sector is steadily growing. The growth of the chemical sector has played a very important role in the economic growth of the country, but the risks associated with production and consumption of chemical need to be identified and addressed for management of risk. Though the previous chapter has indicated that the risk associated with production is mainly in the western region due to large number of chemical industries in clusters, however, the risk associated with consumption is spread throughout the country. While examining the priority concerns related to chemical production, import, export and consumption, the same need to be addressed with the volume of chemicals produced and handled and also risk associated in terms of impact on environment and health. The subsequent paragraphs highlight the problem.

3.2 Priority Associated with the identified Chemical Industrial Sectors

As stated earlier, priority matrix with respect to sector specific chemical is governed by two parameters viz. volume and risk of chemicals. Risk is generally associated with parameters such as persistency, toxicity, carcinogenicity / mutagenicity, Bio-accumulation / Bio-magnification and dispersibililty. The matrix (3 X 3) is attempted and presented in **Table 52**.

Table 52: Priority Matrix with respect to Risk and Volume

VOLUME / RISK	HIGH	MEDIUM	LOW
HIGH	Oil refinery, Petrochemicals	Pesticides	Bulk-drugs, Dyes & dye intermediates
MEDIUM	Fertilisers, Chlor-alkali	-	-
LOW	Soda ash	Paints, Inks & printing inks	-

The volume is governed by three levels i.e., High (≥ 1000 thousand MTPA of total production in the sector), Medium (≥ 100 thousand MTPA and < 1000 thousand MTPA of total production in the sector) and Low (< 100 thousand MTPA of total production in the sector).

The priority management scale shall be categorised as highest, high, medium, low and lowest.

The highest priority sectors are Oil Refinery and Petrochemicals. High priority sectors are Pesticides, Fertiliser and Chlor-Alkali. The Medium priority sectors are Bulk-Drugs and Dye & Dye Intermediates, whereas low priority sectors are Paints and Inks & Printing Inks.

3.3 Nature of problems associated with the Chemical Industry

In absence of database, this paragraph deals with the subject qualitatively – outcomes may be considered only indicative in nature. An attempt is made to indicate the nature of problems in the chemical industry in **Table 53**. Amongst the problems being faced are use of obsolete and outdated technologies by units in the small-scale sector (which generate significant quantities of wastes and lower production yields) and insufficient awareness amongst the manufacturers and the consumer categories.

3.4 Ranking based on priority concerns related to problems

An attempt is made for ranking the priority concerns related to problems, which is presented in **Table 54** based on the potential impact to large number of persons affected. This Table has been prepared based on the experience of Members of the Technical Committee. Close examination of this Table reveals that the most top priority ranking problems are treatment and disposal of hazardous wastes (insufficient disposal facilities, though efforts are underway to provide such facilities at least for the important chemical clusters).

The disposal of obsolete chemicals also exists (lower volumes involved). Ground water contamination is a problem of priority concern as remediation of contaminated ground water has been found to be prohibitively expensive. It is pertinent to mention that the ground water is used as a drinking water source by large number of people in India. The ranking 3 and 4 are important and significant as compared to 1 and 2, but the potential impact with respect to size of population is low.

Table 53: Nature of problems associated with the chemical industries

Area	Nature of Problem	City / Region	Brief Description of Problem Area	Chemicals/ Pollutants	Present Status
Production	Mitigation of environmental pollution	Largely the industrial estates in Gujarat, Maharashtra, Andhra Pradesh and other industrial clusters and isolated industrial area through out the country	Industries and statutory authorities are engaged in pollution abatement but the measures taken are not adequate so that pollution load to receiving environment is within its assimilative capacity	Treated/untreated wastewater, emissions, hazardous wastes, rejected products and process rejects	Sizable pollution mitigation has been achieved in some of the areas through common waste (wastewater and hazardous waste) treatment and disposal facilities. Common incineration systems have also been set up in Gujarat, Maharashtra and Andhra Pradesh.
	Implementation of environmental regulation	Various States / UTs	Lack of coordination between different government agencies and lack of implementation (sustained operation of pollution control devices)	-	Statutory bodies at States / UTs level require more funding (in some cases), infra structure and technical support
	Obsolete / Outdated technologies	Mainly small-scale industries	Lack of funds and sufficient knowledge	Low yield, partially treated / untreated wastewater, hazardous wastes, rejected products and process rejects	Yet to achieve pollution control objectives even with initiatives taken for waste minimisation/ cleaner production.

Area	Nature of Problem	City / Region	Brief Description of Problem Area	Chemicals/ Pollutants	Present Status
	Lack of general Awareness	Various States / UTs	Pollution problems are overlooked. Lack of priority.	Various pollutants	Environmental Awareness is improving.
	Industrial Accidents	Industrial areas through out the country	Accidental release of chemicals	Various Chemicals	Under MSIHC rules, most Industries have prepared on-site emergency plans. District authorities have also prepared off-site emergency plans. Mock-drills are also conducted. Industrial Estate like Ankleshwar has set up Disaster Prevention and Management Centre
	Disposal of hazardous wastes	Industrial areas	Groundwater / soil contamination in some locations due to part dumping of wastes	Heavy metals and leachable chemicals	Common treatment and disposal facilities have been developed in major industrial areas and at some States also developed. Few common incineration facilities in Gujarat, Maharashtra and Andhra Pradesh
	Occupational health	Industrial workers	The health problems are not identified or manifested after a long time	Asbestos, Silica, VOCs, PCBs	Awareness is increasing, however, proper training / system in hazard identification is required. Many industries do not have adequate treatment facilities and well-qualified doctors.

Area	Nature of Problem	City / Region	Brief Description of Problem Area	Chemicals/ Pollutants	Present Status
	General safety awareness	Industrial workers and population close to the industrial clusters	Lack of general safety awareness	Exposure of hazardous chemicals	Information on chemicals handled are displayed by industries. Training programs are also conducted.
	Transportation	Throughout the country	Accidental spillage, lack of monitoring of vehicles, untrained drivers and handling staff	Hazardous chemicals	Guidelines and policies are available. Road conditions (Highways) are improving.
Use	Supplier related	Throughout the country	Lack of formal training on formulation, handling, chemicals poisoning, etc.	Hazardous chemicals especially pesticides and others of toxic nature	Requires lot of training to formulators, dealers and suppliers.
	User related	Throughout the country	Lack of information and training in handling, and use, remedial measures in case of poisoning, Contamination of ponds, soil and ground water due to over usage	Hazardous chemicals especially pesticides and others of toxic nature	The health hazards are manifested after a long time. Majority of the farmers are uneducated and are not aware of the health and environmental implications

Table 54: Rankings based on priority concerns of related to problems

Nature of Problem	Scale of Problem[a]	Level of Concern[b]	Ability to Control Problem[b]	Availability of Statistical data[c]	Specific Chemicals Creating Concern	Priority Ranking[d]
Air Pollution	Local to Regional	Medium	High	Sufficient	RSPM, VOCs	3
Pollution of inland Waterways	Local to Regional	Medium	Medium	Sufficient	Organics (not easily biodegradable), TDS	3
Marine Pollution	Local	Low	High	Sufficient	Metals, Organics (toxic & persistent / bioaccumulation)	4
Groundwater Pollution	Local	Medium to High	Medium	Less than Sufficient	TDS, Fluoride, Heavy Metals	2
Soil Contamination	Local	Low	Medium	Insufficient	Salinity	4
Chemical Residue in Food	Local	Low	Medium	Less than sufficient	Heavy Metals	4
Drinking Water Contamination	Local	Low to Medium	High	Sufficient	Dissolved solids, Fluoride	3
Hazardous Waste Treatment / Disposal	Local	Highest	Medium	Sufficient	Salt bearing Organics	1
Occupational Health: Industrial	Local	Medium	Medium	Insufficient	VOCs, Dust emissions	3
Public Health	Local	Low	Medium	Not sufficient	VOCs, Pesticides, heavy metals	3
Chemical Accidents (Industrial)	Local	Medium	Sufficient	Sufficient	Storage of chemicals under pressure	3
Chemical Accidents during Transportation	Regional	Medium	Not Sufficient	Less than sufficient	Flammable/ toxic chemicals	3
Impact of Chemical (unknown)	Local	Low	Sufficient	Less than Sufficient	Hazardous	4
Storage / Disposal of Obsolete Chemicals	National	Medium	Low	Not Sufficient	Pesticides	2
Chemical Poisoning / Suicides	National	Low	Medium	Not Sufficient	Pesticides	4
Persistent Organic Pollutants	National	Low	Low	Not Sufficient	Dioxin / Furans	3

Note: a: scale of problem or level of concern (Local, regional, or national); b :Ability to control pollution (low, medium, or high; c: Sufficient, less than insufficient, not sufficient) d: Ranking based on the Priority of the problem (1-highest, 2- high, 3- medium and 4- low).

3.5 Comments / Analysis

In order to establish relative priorities of concern related to national problems in chemical management, the availability of statistical data / information is insufficient in some sectors such as paints, ink & ink printing, etc.

Database with respect to occupational health, chemical accidents during transport and chemical poisoning is not available. Information pertaining to drinking water contamination and chemical residues in food, and data based on persistent organic pollutants are available from various sources. However, these data need to be verified further.

For better data management it is suggested that

- Industries, trade associations should promote data collection, compilation and dissemination pertaining to environmental concern

- Establish permanent networking systems / windows for information exchange.

- CPCB / MoEF to evolve criteria for accreditation and guidelines applicable to trade associations so as to collect environment related data.

CHAPTER 4

LEGAL INSTUMENTS AND NON-REGULATORY MECHANISMS FOR MANAGING CHEMICALS

4.1 Background

The previous Chapters 1, 2 and 3 have highlighted the extent of the country and the wide diversity or spread (almost all sectors covered), scale (right from small scale to global scale plants), technology (home grown / disorganised to state of the art technologies), industry concentration (clusters or production "hubs" to industry located in remote areas) and related issues of the chemical sector. Priority concerns have been highlighted. To manage these, there is a need for a well-defined legal framework.

Legislation in India is fairly comprehensive capturing various stages of chemicals lifecycles through different legal instruments. However, due to cross - sectoral nature of chemical management, several pieces of legislation, regulations or standards in the country address chemicals in different ways. Additionally, there are specific legal instruments dealing with a particular category of chemicals, such as pesticides, petroleum, explosives etc. Many of these laws, regulations, standards, decrees or other legal instruments are relevant even though they are not limited to or specifically target chemicals. For example, Central Motor Vehicles Rules deal with almost all aspects of road transportation in general and also specifically addresses transportation of hazardous goods.

In addition to legislative control, there are non-regulatory mechanisms adopted by industries for chemical management. These mechanisms include Responsible Care Programme, Corporate Responsibility for Environment Protection (CREP), ISO 14001:2004, OHSAS 18001 and various others including incentives, tax benefits, awards etc.

This chapter addresses various aspects of legal instruments applicable to chemical management in the country along with overall policy approaches and non-regulatory mechanisms for chemical management.

4.2 Overview of the National Legal Instruments which Address the Management of Chemicals

Table 55 gives a comprehensive list of all the laws, regulations, rules, decrees or other legal instruments relevant to the management of chemicals. In this Table all the legal instruments are covered which address chemicals in one-way or the other. For each legal instrument, responsible ministries or bodies, chemical use categories, objective of legislation and articles relevant to the management of chemicals are discussed.

Refer **Exhibit 1** for overall view of Legal Instruments addressing management of chemicals in India.

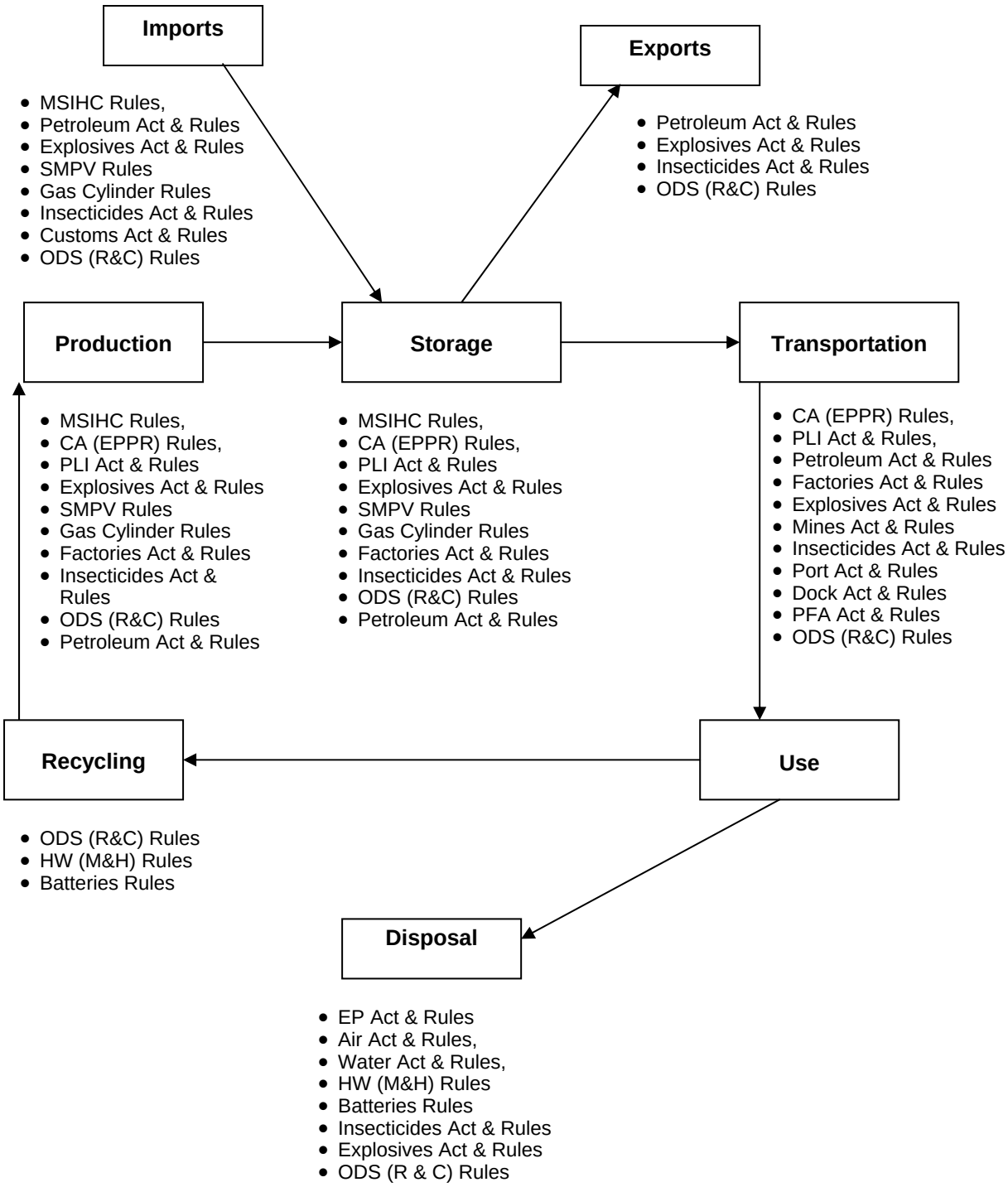


Exhibit I: Overall view of legal instruments addressing chemicals management

Legal instruments in terms of Acts and Rules can be classified under four broad heads depending upon their area of operation as follows:

1. Environmental management
2. Chemical safety and emergency management
3. Specific chemicals category / container
4. Chemicals management

Various Acts and Rules operative under the above heads are prescribed in **Exhibit II** and also covered in **Table 55**.

Table 54 also gives enforcement ranking for legal instrument. Ranking is done by giving collective ranking to each legal instrument on a scale of 1 to 5 for four different parameters viz. coverage, inspection and vigilance, public awareness, procedure for obtaining information. Ranking Column shows that out of 38 legal instruments considered for ranking, 25 are ranked as effective and 13 as fair, shown in **Fig 9**.

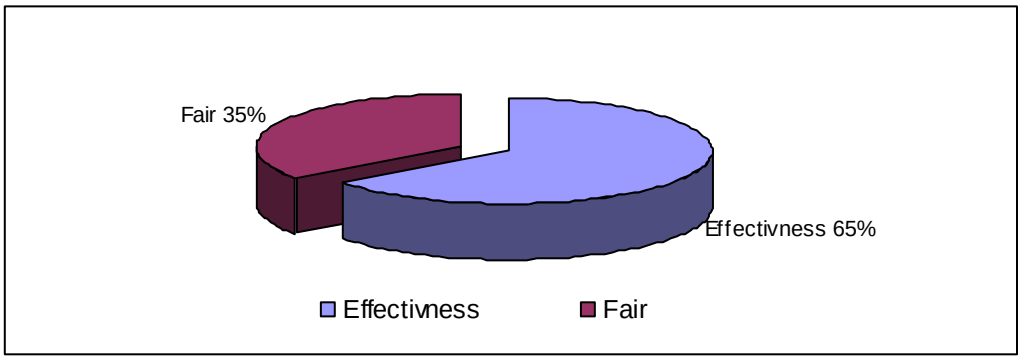


Fig. 9: Effectiveness of Legal Instruments

4.3 Summary Description of Key Legal Instruments Relating to Chemicals

It can be seen from **Table 55**, that there are 40 major legal instruments at the National level, which address chemical management in some form or the other. Out of these, there are certain instruments, which are specifically designed for chemical management or address some important components of the chemicals management not addressed by any other legal instrument. Therefore, a short listing was done to separate out those legal instruments, which are considered of particular importance for the management of chemicals. These short-listed legal instruments are:

A. The Environment (Protection) Act, 1986, amended 1991

- Hazardous Waste (Management and Handling) Rules, 1989, amended 2000 and 2003
- Manufacture, Storage and Import of Hazardous Chemical Rules, 1989, amended 1994 and 2000
- Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
- Ozone Depleting Substances (Regulation and Control) Rules, 2000

Acts and Rules related to Environmental Management	***The Air (Prevention and Control of Pollution) Act, 1981 amended 1987***
	The Air (Prevention and Control of Pollution) (Union Territories) Rules, 1983
	The Water (Prevention and Control of Pollution) Act, 1974, amended 1988
	The Water (Prevention and Control of Pollution) Rules, 1975
	The Environment (Protection) Act, 1986, amended 1991
	Environmental (Protection) Rules, 1986 (amended in 1999, 2001, 2002, 2002, 2002, 2003, 2004)
	Hazardous Wastes (Management and Handling) Rules, 1989 amended 2000 and 2003
	EIA Notification, 1994
	Ozone Depleting Substances (Regulation and Control) Rules, 2000
	Batteries (Management and Handling) Rules, 2001.
Acts and Rules related to Chemical Safety and Emergency Management	*Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 amended 2000*
	Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
	Public Liability Insurance Act, 1991 amended 1992
	Public Liability Insurance Rules, 1991 amended 1993
Acts and Rules related to Specific Chemical Category/Container	***The Petroleum Act, 1934***
	The Petroleum Rules, 2002
	The Calcium Carbide Rules, 1987
	The Explosives Act, 1884
	The Explosives Rules, 1983
	The Gas Cylinder Rules, 2004
	The Static and Mobile Pressure Vessels (Unfired) Rules, 1981
	The Insecticides Act, 1968
	The Insecticides Rules, 1971
	The Essential Commodities Act, 1955
	The Fertiliser (Control) Order, 1985
Other Acts and Rules Relevant to Chemicals Management	***Factories Act, 1948***
	The Motor Vehicles Act, 1988
	The Central Motor Vehicles Rules, 1989
	The Mines Act 1952
	The Customs Act, 1962
	The Merchant Shipping Act, 1958 amended in 2002 and 2003
	Merchant Shipping (carriage of Cargo) Rules 1995
	The Indian Ports Act, 1908
	The Dock Workers (Safety, Health and Welfare) Act, 1986
	The Dock Workers (Safety, Health and Welfare) Rules, 1990
	Drugs and Cosmetics Act, 1940
	The Prevention of Food Adulteration Act, 1954
	The National Disaster Management Act, 2005
	The Prevention of Food Adulteration Rules, 1955
	The Prevention of Terrorism Act, 2002

Exhibit II: List of Legal Instruments of different Areas

B. Public Liability Insurance Act, 1991 amended 1992

- ✓ Public Liability Insurance Rules, 1991 amended 1993

C. Factories Act, 1948

D. The Petroleum Act, 1934

- ✓ The Petroleum Rules, 2002

E. The Explosives Act, 1884

- ✓ The Explosives Rules, 1983

F. The Insecticides Act, 1968

- ✓ The Insecticides Rules, 1971

G. The Motor Vehicles Act, 1988

- ✓ The Central Motor Vehicles Rules, 1989

H. Drugs and Cosmetics Act, 1940

I. The Prevention of Food Adulteration Act, 1954

4.3.1 Hazardous Wastes (Management and Handling) Rules, 1989, amended 2000 and 2003 (HWMH Rules)

List of Specific Chemicals / Criteria

"Hazardous Waste" as defined in the rules, means any waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or when in contact with other wastes or substances. HW (M&H) Rules apply to handling of hazardous wastes mainly from various industries handling different types of hazardous chemicals. These rules include:

- ➲ Schedule I – List of process hazardous wastes
- ➲ Schedule II – List of waste substances with concentration limits
- ➲ Schedule III – List of waste to be applicable only for imports and exports.
- ➲ Schedule IV - List of non-ferrous metal wastes applicable for registration of recyclers

Schedule III is adopted from Annex VIII and IX of the Basel Convention on trans-boundary movement of Hazardous Wastes and modified to the extent that certain waste categories given in List 'A' (Annex VIII) of Basel Convention have been prohibited for import and export under the Environment (Protection) Act, 1986.

Administrative Procedures and Management Schemes

- Administrative procedures and management schemes for hazardous wastes management and handling have elaborately covered in various rules. Responsibilities and duties of the occupier and operator of a facility as given at Rule 4 and 4A respectively, whereas duties of the authorities are referred to at Rule 4B and detailed at Schedule 7 of the Rules.

- Collection, treatment, storage and disposal of hazardous wastes are permitted only in such facilities, which are authorised by the State Pollution Control Board or Pollution Control Committee in case of union territories (Rule 5).

- Occupier or operator of a facility to ensure that hazardous wastes are packaged based on the composition in a manner suitable for handling, storage and transport, and the labelling and packaging shall be easily visible and be able to withstand physical conditions and climatic factors. Packaging, labelling and transport of hazardous wastes are to be in accordance with the provisions of the rules under the Central Motor Vehicles Act and other guidelines issued from time to time. Labels should be as per Form 8. (Rule 7).

- Procedure has been laid for identification, assessment and development of disposal sites (Rule 8).

- Import and export of hazardous wastes for dumping and disposal is prohibited (Rule 11).

- Import and export of hazardous wastes for recycling and reuse are regulated (Rules 12, 13 & 14).

- Procedure for registration and renewal of registration of recyclers and re-refiners is laid down (Rule 19).

Monitoring / Implementation Mechanism

- For monitoring and implementation of the Rules, duties of the authorities are referred to at Rule 4B and are detailed at Schedule VII.

- The State Pollution Control Board or the Pollution Control Committee has been given power to suspend or cancel an authorisation in case of non-compliance (Rule 6).

- To monitor and regulate the transportation of hazardous waste, 6 - copy manifest system is introduced in the Rule (Rule 7).

- The occupier and operator of a facility shall maintain record of collection, reception, treatment, transport, storage and disposal of hazardous wastes and shall file annual return to the State Pollution Control Board or the Pollution Control Committee (Rule 9).

- Illegal traffic has been defined along with ways to handle this (Rule 15).

- The occupier, transporters and operator of a facility shall be liable for any damages caused to the environment, and penal provisions are defined for the same (Rule 16).

Databases Generation under the Rules

- Data of all the occupiers handling, or recyclers recycling, hazardous wastes when they make application for authorisation in Form 1 to the Member-Secretary, State Pollution Control Board or the Pollution Control Committee, as the case may be or any officer designated by the State Pollution Control Board or the Pollution Control Committee are stored in a database.

- Every State Pollution Control Board or the Pollution Control Committee to maintain a register containing particulars of the conditions imposed under these rules for any disposal of hazardous wastes on any land or premises. The entries in the register are considered as proof of grant of authorisation for management and handling of hazardous wastes on such land or premises and the conditions subject to which it was granted.

- Any hazardous waste transported is recorded in manifest in Form 9 (six-colour coded copies); one of the copies is sent to the State Pollution Control Board or the Pollution Control Committee.

- The occupier and operator of a facility maintains record of collection, reception, treatment, transport, storage and disposal of hazardous wastes, and file annual return to the State Pollution Control Board or the Pollution Control Committee (Rule 9).

- Central Pollution Control Board registers and maintains data of every person desirous of recycling or re-refining non-ferrous metal wastes as specified in Schedule IV or used oil or waste oil (Rule 19).

4.3.2 Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 amended 1994 and 2000

List of Specific Chemicals / Criteria

Hazardous Chemicals covered in the rules are:

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 II; and

iii. any chemical listed in Column 2 of Schedule III; where,

Schedule I Part I gives criteria for identifying toxic, flammable and explosive chemicals and Part II lists 684 hazardous chemicals.

Schedule II lists 25 chemicals and 5 categories along with two sets of threshold quantities as the criteria for applicability of various rules to isolated storages.

Schedule III lists 179 chemicals (Part I) and six categories (Part II) along with two sets of threshold quantities as qualification for applicability of various rules to industrial installations.

Administrative Procedures and Management Schemes

- Occupier to identify major accident hazards, take adequate steps to prevent major accidents and limit their consequences to person and the environment and provide to the persons working on the site with information, training and equipment including antidotes necessary to ensure their safety (Rule 4).

- Occupier has to obtain approval and notification of sites by providing information as per Schedule 7 to the concerned authority (Rule 7).

- Occupier (Schedule III Column 4 criteria only) has to prepare safety report before commencement of activity, update the same every three years or before any modification in the plant. Also safety audit needs to be carried out every year by an external expert and these reports to be submitted to concerned authority (Rules 10 & 11).

- Occupier shall prepare and keep up-to-date an on-site emergency plan containing details specified in Schedule II and ensure that every person on the site who is affected by the plan-is informed of its relevant provisions (Rule 13).

- Occupier shall take appropriate steps to inform persons outside the site who are likely to be in an area, which may be affected by 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 (Rule 15).

- Occupier shall develop a safety data sheet as specified in Schedule 9 in respect of a hazardous chemical handled by him and also ensures that every container of a hazardous chemical shall be clearly labelled or marked to identify the contents of the container, the name and address of manufacturer or importer of the hazardous chemical; the physical, chemical and toxicological data as per the criteria given at Part I of Schedule I (Rule 17).

- Regulation of import of hazardous chemicals (Rule 18).

Monitoring / Implementation Mechanism

- For monitoring and implementation of the rules, various authorities have been identified and their roles and responsibilities defined in Schedule V (Rule 3).

- Where a major accident occurs on a site or in a pipeline, the occupier shall forthwith notify the concerned authority. The concerned authority shall undertake a full analysis of the major accident and send the requisite information to the Ministry of Environment and Forests through appropriate channel (Rule 5).

- Concerned authority shall prepare and keep up-to-date an off-site emergency plan containing details specified in Schedule XII and carry out mock trial once in a year (Rule 14)

- Concerned authority shall serve an improvement notice in case a person has contravened the provisions of these rules, requiring that person to remedy the contravention (Rule 19).

Databases Generation under the Rules

- List of Major Accident Hazard (MAH) units prepared and kept updated by the Director of Industrial Safety and Health/Chief Inspector of Factories at the State level.

- Data on major accidents

- Data on all the hazardous chemicals imported in the country

Provision for the Protection of Proprietary Information

- For the purpose of evaluating information notified under Rule 5 or 7 to 15, the concerned authority discloses that information to some other person that other person shall not use that information for any purpose except for the purpose of the concerned authority disclosing it, and

before disclosing the information the concerned authority shall inform that other person of his obligations under this paragraph.

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

List of Specific Chemicals/Criteria

Hazardous Chemicals covered in the rules are:

- any chemical which satisfies any of the criteria laid down in Part I of Schedule II and is listed in column 2 of Part II of this Schedule;
- any chemical listed in Column 2 of Schedule II; and
- any chemical listed in Column 2 of Schedule III

where,

Schedule I Part I gives criteria for identifying toxic, flammable and explosive chemicals and Part II lists 430 hazardous chemicals.

Schedule II lists 25 chemicals and 2 categories along with threshold quantities.

Schedule III lists 179 chemicals (Part I) and 3 categories (Part II) along with threshold quantities.

Administrative Procedures and Management Schemes

- Constitution of the Central Crisis Group (CCG), State Crisis Group (SCG), District Crisis Group (DCG) and Local Crisis Group (LCG) to deal with chemical accidents at different levels;
- Constitution of the Crisis Alert System; and
- Crisis Groups (CCG, SCG, DCG and LCG) to provide information to public regarding chemical accidents – prevention, preparedness and mitigation at different levels.

Monitoring / Implementation Mechanism

- CCG shall monitor the post-accident situation arising out of major chemical accident, conduct post-accident analysis, review district “offsite emergency plans” and review the progress report of SCG.
- SCG shall review the “offsite emergency plans” in the State, monitor post-accident situation and review the progress report of submitted by DCG.

- DCG shall review the onsite emergency plans prepared by occupiers, monitor chemical accidents and conduct full-scale mock trial of chemical accident each year.

- LCG shall educate the population likely to be affected in a chemical accident and conduct one full-scale mock trial of a chemical accident every six months.

Databases Generation under the Rules

- List of Major Accident Hazard (MAH) Installations;

- List of Major Chemical Accidents in chronological order;

- List of Crisis Group members and list of experts and officials in the States who are concerned with the management of chemical accidents; and

- District-wise offsite emergency plans

4.3.4 Ozone Depleting Substances (Regulation and Control) Rules, 2000

List of Specific Chemicals / Criteria

- Ozone Depleting Substances (ODS) covered in the rules are substances specified in Column (2) of Schedule I, whether existing by itself or in a mixture. Schedule I lists 95 such substances along with their Ozone Depleting Potential.

Administrative Procedures and Management Schemes

- Only registered (with the authority as specified in Schedule V) persons shall produce or cause to produce any ozone depleting substance after the date specified in Column 5 of Schedule V.

- Production and consumption quantities of Ozone Depleting Substances are regulated as per Schedule II, III and IV.

- Export to or import from countries not specified in Schedule VI, is prohibited for all the Ozone Depleting Substances.

- Ozone depleting substances are to be exported to or imported from countries specified in Schedule VI under a licence issued by the authority.

- Only registered (with the authority as specified in Schedule V)) persons shall sell stock or distribute any ozone depleting substance after the date specified in Column 5 of Schedule V.

- Purchase of ozone depleting substances not permitted without declaration (specified in Part I of Schedule XII).

- Use of ozone depleting substance not permitted without registration with the authority specified in Column 4 of that Schedule.

- New investments with ozone depleting substances not permitted after the date specified in Column 7 of Schedules II and III.

- Import, export and sale of products made with or containing ozone depleting substances not permitted after the date specified in Column 4 of that Schedule unless he obtains a licence issued by the authority:

- Reclamation and destruction of ozone depleting substances not permitted unless registered with the authority specified in Column 4 of that Schedule.

- Manufacture, import and export of compressors not permitted unless registered with the authority, specified in Column 4 of that Schedule.

Monitoring / Implementation Mechanism

- Every person who produces, imports, exports or sells any ozone depleting substance shall maintain records and file reports in the manner specified in Part I of Schedule X.

- Every person stocking or purchasing any ozone depleting substance for use in activities specified in Column 2 of Schedule IV shall maintain records and file reports in the manner specified in Part II of Schedule X.

- Every person who has received technical or financial assistance from any international organisation or any financial assistance, which includes concession or exemption from payment of duties, from the Central Government, shall maintain records and file reports in the manner specified in Part III of Schedule X and the list of such persons shall be notified by the Central Government.

- Every person who has facility to reclaim an ozone depleting substance shall maintain records and file reports in the manner specified in Part IV of Schedule X.

- Every person who has facility to destroy any ozone depleting substance shall maintain records and file reports in the manner specified in Part V of Schedule X.

- Every person who manufactures, imports, exports or sells compressors shall maintain records and file reports in the manner specified in Part VI of Schedule X.

Databases Generation under the Rules

- List of producers, consumers, users, exporters, importers, reclaimers and destroyers of Ozone Depleting Substances along with type and quantities

4.3.5 Public Liability Insurance Act, 1991, amended 1992 and Public Liability Insurance Rules, 1991, amended 1993

List of Specific Chemicals / Criteria

- Ministry of Environment and Forests, vide their notification dated 24th March, 1992, released a list of chemicals along with quantities for which or exceeding which every owner handling the hazardous substance mentioned in the corresponding entry in Column 2 thereof shall take out insurance policy as per the provisions of the Act. Part I of the list name 179 chemicals in four groups and part II of the list gives the fifth group covering three classes of hazardous Substances not specifically named in Part I.

Administrative Procedures and Management Schemes

- Where death or injury to any person (other than a workman) or damage to any property has resulted from an accident, the owner shall be liable to give such relief as is specified in the Schedule for such death, injury or damage.

- Every owner shall take out, before he starts handling any hazardous substance, one or more insurance policies providing for contracts of insurance thereby he is insured against liability to give relief under Sub-section (1) of Section 3;

- No insurance policy taken out by an owner shall be for an amount less than the amount of the paid-up capital of the undertaking handling any hazardous substance and owned or controlled by that owner and more than the amount, not exceeding fifty crore rupees, as may be prescribed.

- Every owner shall also, together with the amount of premium, pay to the insurer, for being credited to the Relief Fund established under Section 7A, such further amount, not exceeding the amount of premium, as may be prescribed.

- Central Government may, by notification in the Official Gazette, establish a fund to be known as the Environment Relief Fund. The Relief Fund shall be utilised for paying, in accordance with the provisions of this Act.

Monitoring / Implementation Mechanism

- Whenever it comes to the notice of the Collector that an accident has occurred at any place within his jurisdiction, he shall verify the occurrence of such accident and cause publicity to be given in such manner as he deems fit for inviting applications for claim.

- On receipt of an application under Sub-section (I) of Section 6, the Collector shall after giving notice of the application to the owner and after giving the parties an opportunity of being heard, hold an inquiry into the claim or, each of the claims, and may make an award determining the amount of relief which appears to him to be just and specifying the person or persons to whom such amount of relief shall be paid.

- If the Central Government or any person authorised by that Government in this behalf has reason to believe that any owner has been handling any hazardous substance in contravention of any of the provisions of this Act, that Government or, as the case may be, that person may make an application to a Court, not inferior to that of a Metropolitan Magistrate or a Judicial Magistrate (First Class) for restraining such owner from such handling.

- Whoever contravenes any of the provisions of [Sub-section (1), Sub-section (2), Sub-section (2A) or Sub-section (2C)] of Section 4 or fails to comply with any directions issued under Section 12, he shall be punishable imprisonment for a term which shall not be less than one year and six months but which may extend to six years, or with fine which shall not be less than one lakh rupees, or with both.

- Whoever, having already been convicted of an offence under Sub-section (1), is convicted for the second offence or any offence subsequent to the second offence, he shall be punishable with imprisonment for a term which shall not be less than two years but which may extend to seven years and with fine which shall not be less than one lakh rupees.

- If any owner fails to comply with direction issued under section 9 or fails to comply with order issued under Sub-section (2) of Section 11, or obstructs any person in discharge of his functions under Section 10 or Sub-section (1) or Sub-section (3) of Section 11, he shall be punishable with imprisonment which may extend to three months, or with fine which may extend to ten thousand rupees, or with both.

Databases Generation under the Rules

- A register of the application for relief or claim petitions, and, a register of awards and payment made there under, to be maintained by the Collector.

4.3.6 Factories Act, 1948

List of Specific Chemicals/Criteria

- Factories Act applies to the factories as defined in the Act and has a Chapter IV-A, giving provisions relating to hazardous processes. The second schedule of the Act lists 116 chemicals with their permissible levels in work environment. Permissible exposure levels of these chemicals are given in Time Weighted Average (TWA) – 8-hour exposure and also Short Term Exposure Limit (STEL) – 15-minute exposure.

Administrative Procedures and Management Schemes

- Act provides for constitution of a Site Appraisal Committee to grant permission for the initial location of a factory involving hazardous process or for the expansion of any such factory.

- Act provides for compulsory disclosure of information by the occupier regarding dangers including health hazards and the measures to overcome such hazards arising from the exposure to or handling of the material or substances in the manufacture, storage, transportation etc.

- Act provides for laying down of emergency standards of safety in respect of hazardous processes.

- Act lists 116 chemicals with their maximum permissible limit for two sets of exposure duration in work place environment.

- Act provides for setting up of Safety Committee within factories handling hazardous processes. Safety Committee to be constituted with equal number of workers and management representatives, to ensure workers participation in safety management.

Monitoring / Implementation Mechanism

- Act provides for general penalty for offences involving contravention of any provision of the Act. There is special reference for the penalties on contravention of any of the provisions related to Hazardous Processes (Sub-sections 41-B, 41-C and 41-H).

- There is a special provision for making rules for handling dangerous operations, which can expose any person employed in it to a serious risk or bodily injury, poisoning or disease. There is also provision to prohibit employment on account of serious hazards.

- Act provides for accident notification by manager of the factory to authorities when an accident occurs which causes death or which causes any bodily injury preventing injured person to work for 48 hours

or more. In addition, notification is to be given for dangerous occurrence causing bodily injury or disability or not.

- Act empowers state government to appoint a competent person to inquire into the cause of any accident occurring in a factory.

- Act empowers authorities to undertake safety and health surveys in factories.

Databases Generated under the Rules

- Information about the factories, their hazardous processes and storages as submitted to Site Appraisal Committee for grant of permission for the initial location of a factory.

- Occupier of factory involving hazardous processes maintains health records of workers in the factory who are exposed to any chemical, toxic or any other harmful substances.

4.3.7 The Petroleum Act, 1934 and the Petroleum Rules, 2002

List of Specific Chemicals / Criteria

- The Act and Rules apply to “Petroleum”, which is defined as any liquid hydro-carbon or mixture of hydrocarbons and any inflammable mixture (liquid, viscous or solid) containing any liquid hydrocarbon.

Administrative Procedures and Management Schemes

- Import, transport, storage, production, refining, blending, delivery and dispatch of petroleum require licence from authorities – certain quantities based on class of petroleum are exempt from licensing.

- All receptacles containing Petroleum Class A to show warning in conspicuous characters – “Petrol” or “Motor Spirit”.

- Containers of Petroleum are constructed as per the laid down specifications (based on quantities and class of petroleum) and such constructions are to be approved by Chief Controller of Explosives.

Monitoring / Implementation Mechanism

- Penalties are defined in the Act for contravention of provisions of the Act and Rules.

- Central government has power to authorise any officer to enter and search any place where he has reason to believe that any petroleum is being imported, transported, stored, produced, refined or blended otherwise than in accordance with the provisions of the Act and Rules.

- The notice of an accident involving petroleum is required to be given to the Chief Controller immediately and within 24 hours by a letter giving particulars of the occurrence; and to the officer-in-charge of the nearest police station by the quickest means of communication.

Databases Generation under the Rules

- Licensing authorities generate database in the form of application for grant of licences for import, transport, storage, production, refining, blending, delivery and dispatch of petroleum.

- Chief Controller of Explosives receives information on all accidents involving petroleum as per the provisions of the Act and the Rules, hence generating accident data

4.3.8 The Explosives Act, 1884 and the Explosives Rules, 1983

List of Specific Chemicals / Criteria

- The Act and the Rules apply to “Explosives”, which means gunpowder, nitro-glycerine, nitro glycol, gun-cotton, di-nitro-toluene, tri-nitro-toluene, picric acid, di-nitro-phenol, tri-nitro-resorcinol (styphnic acid), cyclo-trimethylene-trinitramine, penta-erythritol-tetranitrate, tetryl, nitro-guanidine, lead azide, lead styphnate, fulminate of mercury or any other metal, diazo-dinitro-phenol, coloured fires or any other substance whether a single chemical compound or a mixture of substances, whether solid or liquid or gaseous used or manufactured with a view to produce a practical effect by explosion or pyrotechnic effect; and includes fog-signals, fireworks, fuses, rockets, percussion caps, detonators, cartridges, ammunition of all descriptions and every adaptation or preparation of an explosive as defined in this clause.

Administrative Procedures and Management Schemes

- Central government issues list of authorised explosives from time to time and there is prohibition on use, manufacture, import, export, sale, possession and transportation of unauthorised explosives.

- Import, export, transport, manufacture, use, possession and sale of explosives is prohibited without a licence. Application of licence is to be made as per the procedure defined in the rules and licence is issued by competent authorities as defined in Schedule IV of the Rules.

- Packaging of explosives is specified for Import, transport, possession and sale of explosives in Schedule II of the Rules. Marking of such packages is also mandatory and is addressed in the Rules.

- Precautions to be observed during handling of explosives are specified including restriction on handling after sunset; prohibition of matches,

fires, smoking, etc; precaution against dangers from water; employment of children, intoxicated persons etc.

Monitoring / Implementation Mechanism

- Controllers have the powers to stop dangerous practices during handling or transportation of explosives and issue orders to remedy the same to any one involved in this.

- Authorities (as specified in the Rules) have powers to search and seizure in regard to explosives.

- Any accident involving explosives need to be reported to the nearest police station, Controller of explosives, and Chief Controller of Explosives. Authorities shall carry out an inquiry into accidents and submit the report to Central Government stating the cause of accident and it circumstances. Central government may initiate a more formal inquiry if required for more serious accidents.

- Punishment of certain offences are defined in the Act for contravention of the rules made under the Act or the conditions of the licence granted under the Rules.

Databases Generation under the Rules

- Licensing authorities generate database in the form of application for grant of licences for Import, transport, storage, manufacture, use, handling, transport and dispatch of explosives.

- List of authorised explosives to be issued by central government from time to time.

- Chief Controller of Explosives receives information on all accidents involving explosives as per the provisions of Act and Rules, hence generating accident data

4.3.9 The Insecticides Act, 1968 and the Insecticides Rules, 1971

List of Specific Chemicals / Criteria

The Insecticides Act regulates the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals, and for matters connected therewith. It applies to insecticides as defined in the Act as:

1. any substance specified in the Schedule; or

2. such other substances (including fungicides and weedicides) as the Central Government may, after consultation with the Board, by

notification in the Official Gazette, include in the Schedule from time to time; or

3. any preparation containing any one or more of such substances;

Administrative Procedures and Management Schemes

- Central Insecticides Board to advise the Central Government and State Governments on technical matters arising out of administration of this Act.

- Any person desiring to import or manufacture any insecticide may apply to the Registration Committee for the registration of such insecticide. Registration Committee to register insecticide after scrutinising their formulae and verifying claims made by the importer or the manufacturer, as the case may be, as regards their efficacy and safety to human beings and animals.

- Any person desiring to manufacture or to sell, stock or exhibit for sale or distribute any insecticide, or to undertake commercial pest control operations with the use of any insecticide has to obtain a licence from licensing officer as per the procedure mentioned in Act and Rules.

- Packaging and labelling is prescribed in the rules for stocking, exhibiting, selling, distributing or transporting any insecticide. Manner of transportation and storage is also prescribed in the Rules.

- Provisions are made in the rules regarding protective clothing, equipment, and other facilities for workers during manufacture, etc. of insecticides including first aid, medical examination, antidotes, training etc.

- Provisions are made in the rules regarding disposal of used packages, surplus materials and washings of insecticides

Monitoring / Implementation Mechanism

- An Insecticide Inspector has the power to enter and search, at all reasonable times and with such assistance, if any, as he considers necessary, any premises in which he has reason to believe that an offence under this Act or the rules has been or is being or is about to be committed, or for the purpose of satisfying himself that the provisions of this Act or the rules or the conditions of any certificate of registration or licence issued are being complied with.

- The Insecticides Inspector shall inspect not less than three times in a year all establishments selling insecticides twice a year all premises licensed for the manufacture of insecticides within the area of his jurisdiction.

- Every person for the time being in charge of any premises where any insecticide is being manufactured or is kept for sale or distribution shall, on being required by an Insecticide Inspector so to do, be legally bound to disclose to the Insecticide Inspector the place where the insecticide is being manufactured or is kept, as the case may be.

- Where any person has been convicted under this Act for contravening any of the provisions of this Act or of the rules, the stock of the insecticide in respect of which the contravention has been made shall be liable to confiscation.

- Whoever Imports, manufactures, sells, stocks or exhibits for sale or distributes any insecticide deemed to be misbranded or without certificate of registration or licence or obstructs an Insecticide Inspector in the exercise of his powers or contravenes any of the provisions of Act or rules, shall be punishable.

Databases Generation under the Rules

- Data on all the pesticides registered in the country.

- Data on manufacturers, sellers, stockers, importers and commercial pest control operators as part of the licensing process.

Provision for the Protection of Proprietary Information

- Except for the purpose of official business or when required by a court of law, an Insecticides Inspector shall not disclose to any person any information acquired by him in the performance of his official duties.

4.3.10 Means of Making Legislation Publicly Known

Some of the important means being followed in making legislation public are:

- Copies of Acts/Rules can be obtained (Free of Cost) by the general public and interested groups/organisations from the relevant department/Ministry

- The Acts/Rules published by the Central Government are published in Hindi and English. Those published by the State Government are published in Hindi, English and also the local language (of the State).

- Private publishers also print copies of the often used or high demand legislations and sell them for a price.

- Websites of relevant ministries and other departments under them also keep updated copies of the relevant acts/rules for information of general public.

- Industry Associations make these rules available to the member industries.

- Training workshops and Awareness programmes organised from government side, industry associations and concerned NGOs.

4.4 Existing Legislation by Use Category Addressing Life Cycle Stages of Chemicals from production / Import through disposal

This section provides a strategic overview of the legal instruments that regulate each stage of chemicals from production/ import through disposal, for each of the main use categories of chemicals addressed in the Profile. The purpose of this overview is to assist in identifying missing elements as well as opportunities for strengthening the existing system.

Table 56 gives overview of legal instruments to manage chemicals by use category. Categories of the chemicals are listed in the left most column along with various stages of chemical life cycle in top row. As can be seen from the Table, every cell has a “X” mark indicating all the categories of chemicals for various stages of their life cycle are adequately addressed by legislation. Titles of important legislation are given in the right most column for reference.

As can be seen from the list of relevant legal instruments, many of the instruments are common for various categories of chemicals. For example, Factories Act applies to all types of factories whether they are dealing with pesticides or petroleum products or any other chemical. In addition, there are certain specific legal instruments for particular category of chemical such as Insecticides Act and Rules apply to pesticides/insecticides only and Explosives Act and rules for explosive substances as defined in the rules.

However, a combination of the general and specific legal instruments makes the complete coverage for all categories of chemicals during their various stages of life cycle.

Table 55: References to Existing Legal Instruments which address the Management of Chemicals

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories / Chemical By-products	Objective of Legislation	Relevant Articles / Provisions	Enforcement Status
1	The Air (Prevention and Control of Pollution) Act, 1981 amended 1987	Central Pollution Control Board (CPCB), State Pollution Control Boards (SPCB) and Pollution Control Committees (PCC) in Union Territories (UT)	Air pollutants from chemical industries	Prevention, control and abatement of air pollution	Section 2: Definitions Section 21: Consent from State Boards 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 Section 37 - 43: Penalties and procedures	Effective
2	The Air (Prevention and Control of Pollution) (Union Territories) Rules, 1983	CPCB, SPCB and PCC for UT	Air pollutants from chemical industries	Prevention, control and abatement of air pollution	Rule 2: Definitions Rule 9: Consent applications	Effective
3	The Water (Prevention and Control of Pollution) Act, 1974 amended 1988	CPCB, SPCB and PCC for UT	Water pollutants from water polluting industries	Prevention and control of water pollution and also maintaining or restoring the wholesomeness of water bodies	Section 2: Definitions Section 20: Power to obtain information Section 21: Power to take samples Section 23: Power of entry and inspection Section 24: Prohibition on disposal Section 25: Restriction on new outlet and new discharge Section 26: Provision regarding existing discharge of sewage or trade effluent Section 27: Refusal or withdrawal of consent by the State Boards Section 41-49: Penalties and procedures	Effective
4	The Water (Prevention and Control of Pollution) Rules, 1975	CPCB, SPCB and PCC for UT	Water pollutants from water polluting industries	The prevention and control of water pollution and also maintaining or restoring the wholesomeness of water bodies	Rule 2: Definitions Rule 30: Power to take samples Rule 32: 7Consent applications	Effective
5	The Environment (Protection) Act, 1986, amended 1991	Ministry of Environment & Forests (MoEF), CPCB, SPCB and PCC for UT	All types of environmental pollutants	Protection and Improvement of the Environment	Section 2: Definitions Section 7: Not to allow emission or discharge in excess of prescribed standards Section 8: Handling of hazardous substances Section 10: Power of entry and inspection Section 11: Power to take samples Section 15 - 19:Penalties and procedures	Fair
6	Environmental (Protection) Rules, 1986 (Amendments in 1999, 2001, 2002, 2003, 2004)	MoEF, CPCB, SPCB and PCC for UT	All types of environmental pollutants	Protection and Improvement of the Environment	Rule 2: Definitions Rule 3: Standards for emission or discharge of environmental pollutants Rule 5: Prohibition and restriction on the location of industries and the carrying on process and operations in different areas Rule 13: Prohibition and restriction on the handling of hazardous substances Rule 14: Submission of environmental statement	Fair

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
7	National Disaster Management Act, 2005	(Establishment of) a National Disaster Management Authority and Sate Disaster Management Authority	None (related to Disasters caused by man made, natural, accident or negligence)	Disaster prevention, mitigation, capacity building, improving preparedness to deal with disaster, response capability and provision of evacuation, rescue, relief and rehabilitation and reconstruction	Rule 2: Definitions Rule 3: Constitution of a National Disaster Management Authority Rule 10: Powers and functions of National Executive Committee Rule 11: Preparation of a "National Plan" Rule 14: Constitution of State Disaster Management Authorities Rule 23: Preparation of "State Plans" Rule 25: Constitution of District Disaster Management Authorities Rule 31: Preparation of "District Plans" Rule 42: Constitution of a National Institute of Disaster Management Rule 44: Constitution of a National Disaster Response Force Rule 46: Constitution of a National Disaster Response Fund	New Act
8	Prevention of Terrorism Act, 2002	Designated Authority (Central level-not below Joint Secretary to the Government, State level-not below Secretary to the Government)	Bombs, dynamite or other explosive substances or inflammable substances or firearms or other lethal weapons or poisons or noxious gases or other chemicals or by any other substances (whether biological or otherwise) of a hazardous nature	Prevention of and dealing with Terrorist activities	Rule 2: Definitions Rule 3: Punishments Rule 18: Declaration of an organisation as a terrorist organisation Rule 23: Constitution of special courts	Fair
9	EIA Notification, 1994	MoEF, SPCB, PCC	Chemicals/ pollutants expected to be generated from industrial activities	Requirement of environmental clearance before establishment/ expansion of certain type of industries/ projects.	Rule 3: Standards for emission or discharge of environmental pollutants	Effective
10	Batteries (Management and Handling) Rules, 2001.	MoEF, CPCB, SPCB and PCC	Lead acid batteries	To control the hazardous waste generation (lead waste) from used lead acid batteries	Rule 5: Prohibition and restriction on the location of industries and the carrying on process and operations in different areas Rule 13: Prohibition and restriction on the handling of hazardous substances Rule 14: Submission of environmental statement Rule 5: Registration of importers Rule 7: Responsibilities of dealer Rule 8: Responsibilities of recycler Rule 9: Procedure for registration / renewal of registration of recyclers Rule 10: Responsibilities of consumer or bulk consumer Rule 11: Responsibilities of auctioneer Rule 14: Computerisation of Records and Returns	

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
11	Hazardous Waste (Management and Handling) Rules, 1989 amended 2000 and 2003	MoEF, CPCB, SPCB, Directorate General of Foreign Trade (DGFT), Port Authority and Customs Authority	Hazardous wastes generated from industries using hazardous chemicals	Management & handling of hazardous wastes in line with the Basel Convention	Rule 2: Application Rule 3: Definitions Rule 4: Responsibility of the occupier and operator of a facility for handling of waste Rule 4A: Duties of the occupier and operator of a facility Rule 4B: Duties of the authority Rule 5: Grant of authorisation for handling hazardous wastes Rule 6: Power to suspend or cancel authorisation 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 15: Illegal traffic Rule 16: Liability of the occupier, transporters 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	Effective
12	Ozone Depleting Substances (Regulation and Control) Rules, 2000	Ministry of Environment & Forests	Ozone depleting substances (ODS)	Regulate the production, import, use, sale, purchase and phase-out of the ODS	Rule 2: Definitions Rule 3: Regulation of production and consumption of ODS Rule 4: Prohibition on export to or import from countries not specified in Schedule VI Rule 5: ODS are to be exported to or imported from countries specified in Schedule VI under a license Rule 6: Regulation of the sale of ODS Rule 7: Regulation on the purchase of ODS Rule 8: Regulation on the use of ODS Rule 9: Prohibition on new investments with ODS Rule 10: Regulation of import, export and sale of products made with or containing ODS Rule 11: Regulation on reclamation and destruction of ODS Rule 12: Regulation on manufacture, import and export of compressors Rule 13: Procedure for registration, cancellation of registration and appeal against such orders Rule 14: Monitoring and reporting requirements	Effective

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
13	Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 amended 2000	MoEF, Chief Controller of Imports and Exports, CPCB, SPCB, PCC, Chief Inspector of Factories, Chief Inspector of Dock Safety, Chief Inspector of Mines, Atomic Energy Regulatory Board (AERB), Chief Controller of Explosives, District Collector or District Emergency Authority, Centre for Environment & Explosive Safety (CEES) under Defence Research & Development Organisation (DRDO)	Hazardous chemicals - Toxic, Explosive, Flammable and Reactive	Regulate the manufacture, storage and import of hazardous chemicals	Rule 2: Definitions Rule 4: Responsibility of the occupier Rule 5: Notification of major accidents Rule 7 - 8: Approval and notification of site and updating Rule 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 Rule 18: Import of hazardous chemicals	Fair
14	Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996	Central Crisis Group (CCG), State Crisis Group (SCG), District Crisis Group (DCG), Local Crisis Group (LCG) and Major Accident Hazard (MAH) Units	Hazardous chemicals - Toxic, Explosive, Flammable and Reactive	Emergency planning preparedness and response to chemical accidents	Rule 2: Definitions Rule 5: Functions of CCG Rule 7: Functions of SCG Rule 9: Functions of DCG Rule 10: Functions of LCG	Fair
15	Public Liability Insurance Act, 1991 amended 1992	MoEF, District Collector	Hazardous Substances	To provide immediate relief to persons affected by accident involving hazardous substances	Section 2: Definitions Section 3: Liability to give relief in certain cases on principle of no fault Section 4: Duty of owner to take out insurance policy Section 7A: Establishment of Environmental Relief Fund (ERF) Section 14 - 18: Penalties and Offences	Fair
16	Public Liability Insurance Rules, 1991 amended 1993	MoEF, District Collector	Hazardous Substances	To provide immediate relief to persons affected by accident involving hazardous substances and also for Establishing an ERF	Rule 2: Definitions Rule 6: Establishment of administration of fund Rule 10: Extent of liability Rule 11: Contribution of the owner to ERF	Fair
17	The Petroleum Act, 1934	Ministry of Petroleum and Natural Gas	Petroleum (Class A, B and C - as defined in the rules)	Regulate the import, transport, storage, production, refining and blending of petroleum	Section 2: Definitions Section 3: Import, transport and storage of petroleum Section 5: Production, refining and blending of petroleum Section 6: Receptacles of dangerous petroleum (Class A) to show a warning Section 23-28: Penalties and Procedure	Effective

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
18	The Petroleum Rules, 2002	Ministry of Petroleum and Natural Gas, Ministry of Shipping (for notification of authorised ports for import), MoEF or SPCB or PCC (for clearance of establishment of loading/unloading facilities at ports) Chief Controller of Explosives (CCoE), District Authority, Commissioner of Customs, Port Conservator, State Maritime Board (Import)	Petroleum (Class A, B and C - as defined in the rules)	Regulate the import, transport, storage, production, refining and blending of petroleum	Rule 2: Definition Chapter I Part II: General provisions Chapter II: Importation of Petroleum Chapter III: Transport of Petroleum Chapter VII: Licenses	Effective
19	The Calcium Carbide Rules, 1987	Ministry of Petroleum and Natural Gas, CCoE, Customs Collector, Port Conservator, Director General of Civil Aviation (DGCA), District Authority	Calcium Carbide	To regulate the import, production, storage, transportation, sale, use and handling and disposal of Calcium Carbide with a view to prevent accidents	Rule 2: Definitions Chapter II: General provisions Chapter III: Importation of carbide Chapter IV: Transportation of carbide Chapter V: Storage of carbide Chapter VI: Licensing Chapter VII: Notice of accident	Effective
20	The Explosives Act,	Ministry of Commerce and Industry (Department of Explosives)	Explosive substances as defined under the Act	To regulate the manufacture, possession, use, sale, transport, export and import of explosives with a view to prevent accidents	Section 4: Definition Section 6: Power for Central government to prohibit the manufacture, possession or importation of especially dangerous explosives Section 6B: Grant of Licenses	Effective
21	The Explosives Rules, 1983	Ministry of Commerce and Industry and CCoE, Port Conservator, Customs Collector, Railway Administration	Explosive substances as defined under the Act	To regulate the manufacture, possession, use, sale, transport, export and import of explosives with a view to prevent accidents	Rule 2: Definition Chapter II: General provisions Chapter III: Import and export Chapter IV: Transport Chapter V: Manufacture of explosives Chapter VI: Possession sale and use Chapter VII: Licenses	Effective

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
22	The Gas Cylinder Rules, 2004	Ministry of Commerce and Industry and CCoE, Port Conservator, Customs Collector, DGCA, District Collector (DC), District Magistrate (DM), Police (Sub inspector to Commissioner)	Gases (Toxic, non-toxic and non-flammable, non-toxic and flammable, Dissolved Acetylene Gas, Non-toxic and flammable liquefiable gas other than Liquefied Petroleum Gas (LPG) and LPG	Regulate the import, storage, handling and transportation of gas cylinders with a view to prevent accidents	Rule 2: Definition Chapter II: General provisions Chapter III: Importation of cylinder Chapter IV: Transport of cylinder Chapter VII: Filling and possession	Effective
23	The Static and Mobile Pressure Vessels (Unfired) Rules, 1981	Ministry of Commerce and Industry and CCoE, Port Conservator, Customs Collector, DGCA, DC, DM, Police (Sub inspector to Commissioner)	Gases (Toxic, non-toxic and non-flammable, non-toxic and flammable, Dissolved Acetylene Gas, Non-toxic and flammable liquefiable gas other than Liquefied Petroleum Gas (LPG)) and LPG	Regulate the import, manufacture, design, installation, transportation, handling, use and testing of mobile and static pressure vessels (unfired) with a view to prevent accidents	Rule 2: Definition Chapter III: Storage Chapter IV: Transport Chapter V: Licences	Effective
24	The Insecticides Act, 1968	Ministry of Agriculture, Central Insecticides Board, and Registration Committee	Insecticides including fungicides and weedicides	Regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals	Section 3: Definitions Section 9: Registration of Insecticides Section 13: Grant of Licence Section 17: Prohibition of import and manufacture of certain insecticides Section 18: Prohibition of sale etc. of certain insecticides Section 25: Confiscation Section 26: Notification of poisoning Section 27: Prohibition of sale etc. of insecticide for reasons of public safety Section 28: Notification of cancellation of registration, etc. Section 29: Offences and Punishment	Effective

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
25	The Insecticides Rules, 1971	Ministry of Agriculture, Central Insecticides Board, and Registration Committee	Insecticides including fungicides and weedicides	Regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to human beings or animals	Rule 2: Definition Rule 6: Manner of registration Rule 9: Licence to manufacture insecticides Rule 10: License for sale etc. of insecticides Rule 10A: Segregation and disposal of date-expired pesticides Rule 10B: Special provision with regard to sulphur Rule 10C: Prohibition against sale or storage of insecticides in certain places Rule 15: Issuing cash memo and maintenance of records Rule 16: Prohibition of sale or distribution unless packed and labelled Rule 17: Packaging of insecticides Rule 18: Leaflet to be contained in a package Rule 19: Manner of labelling Rule 20: Prohibition against altering inscriptions etc. on containers, labels or wrappers of insecticides Rule 35: Manner of packing, storage while on transit by rail Rule 36: Conditions to be specified for storage of insecticides Rule 37: Medical examination Rule 38: First-aid measures Rule 39: Protective clothing Rule 40: Respiratory devices Rule 41: Manufacturers etc. to keep sufficient quantities of antidotes and first-aid medicines Rule 42: Training of workers Rule 43: Aerial spraying operations Rule 44: Disposal of used packages, surplus materials and washings of insecticides	Effective
26	The Fertiliser (Control) Order, 1985 under the Essential Commodities Act, 1955	Ministry of Agriculture (Department of Agriculture and Cooperation)	Fertilisers	Regulate the import, manufacture, sale, transport, distribution and use of fertilisers	Order 2: Definitions Section III: Control on distribution of fertilisers by manufacturer/ importer Section V: Manufacture of mixtures of fertilisers Section VII: Analysis of samples	Effective
27	The Motor Vehicles Act, 1988	Ministry of Shipping, Road Transport and Highways	Hazardous and dangerous goods	To consolidate and amend the law relating to motor vehicles	Section 2: Definition Chapter II: Licensing of drivers of motor vehicles Chapter VII: Construction equipment and maintenance of motor vehicles	Fair

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
28	Factories Act, 1948	Ministry of Labour, Directorate General, Factory Advice Service and Labour Institutes (DGFASLI) and Directorate of Industrial Safety and Health/Factories Inspectorate	Chemicals as specified in the Table	Control of workplace environment, and providing for good health and safety of workers	Section 2: Interpretation Section 6: Approval, licensing and registration of factories Section 7A: General duties of the occupier Section 7B: General duties of manufacturers etc., as regards articles and substances for use in factories Section 12: Disposal of wastes and effluents Section 14: Dust and fume Section 36: Precautions against dangerous fumes, gases etc. Section 37: Explosion or inflammable dust, gas etc. Chapter IVA: Provisions relating to hazardous processes Section 87: Dangerous operations Section 87A: Power to prohibit employment on account of serious hazard Section 88: Notice of certain accident Section 88A: Notice of certain dangerous occurrences Chapter X: Penalties and procedures	Effective
29	The Central Motor Vehicles Rules, 1989	Ministry of Shipping, Road Transport and Highways	Hazardous and dangerous goods	To consolidate and amend the laws relating to motor vehicles including regulating the transportation of dangerous goods with a view to preventing loss of life or damage to the environment	Rule 2: Definition Rule 9: Educational qualification for drivers of goods carriages carrying dangerous or hazardous goods Rule 129: Transportation of goods of dangerous or hazardous nature to human life Rule 129A: Spark arrestors Rule 130: Manner of display of class labels Rule 131: Responsibility of the consignor for safe transport of dangerous or hazardous goods Rule 132: Responsibility of the transporter or owner of goods carriage Rule 133: Responsibility of the driver Rule 134: Emergency Information Panel Rule 135: Driver to be instructed Rule 136: Driver to report to the police station about accident Rule 137: Class labels	Fair
30	The Mines Act, 1952	Ministry of Coal and Mines	Use of toxic and inflammable gases, dust or mixtures	Safety of the mine workers	Section 2: Definitions Chapter IV: Mining operations and management of mines Chapter V: Provisions as to health and safety Chapter IX: Penalties and procedure	Effective
31	The Customs Act, 1962	Central Board of Excise and Customs (CBEC), Ministry of Finance	Hazardous goods	To prevent entry of illegal hazardous goods or banned goods including hazardous or banned chemicals	Section 2: Definitions Section 11: Power to prohibit importation or exportation of goods	Effective

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
32	The Merchant Shipping Act, 1958 amended in 2002 and 2003	Ministry of Shipping, Road Transport and Highways	All packaged cargo including dangerous and hazardous goods as defined in the rules	For safe handling and transportation of cargo including dangerous goods to prevent accident	Section 3: Definitions Section 331: Carriage of dangerous goods	Fair
33	The Indian Ports Act, 1908	Ministry of Shipping, Road Transport and Highways	All Chemicals - handling and storage	For control of activities on ports including safety of shipping and conservation of ports	Section 2: Definitions Chapter IV: Rules for the safety of shipping and the conservation of ports Chapter VII: Provisions with respect to penalties	Fair
34	The Dock Workers (Safety, Health and Welfare) Act, 1986	Ministry of Labour, DGFASLI and Directorate of Dock Safety	All Chemicals termed as dangerous goods	Safety of Dock workers including handling of dangerous goods	Section 2: Definitions Section 4: Powers of inspectors Section 5: Powers of inspectors where employment of dock workers are dangerous Section 7: Restriction on disclosure of information Section 9: Advisory committee Section 10: Power of appropriate Government to direct inquiry into cases of accidents or diseases Section 11: Obligations of dock workers Section 14: Penalties	Effective
35	The Dock Workers (Safety, Health and Welfare) Regulations, 1990	Ministry of Labour, DGFASLI and Directorate of Dock Safety	All Chemicals termed as dangerous goods	Safety of Dock workers including handling of dangerous goods	Rule 2: Definition Rule 8: Enquiry into causes of accidents Rule 9: Advisory committee Rule 10: Competent persons Rule 11: Persons to appear at inquiry Rule 12: Inquiry in public	Effective
36	The Drugs and Cosmetics Act, 1940	Ministry of Health and Family Welfare	All types of drugs and cosmetics	To regulate import, manufacture, distribution and sale of drugs	Section 2: Definitions Chapter III: Import of drugs and cosmetics Chapter IV: Manufacture, sale and distribution of drugs and cosmetics	Fair
37	The Prevention of Food Adulteration Act, 1954	Ministry of Health and Family Welfare	All food-grade chemicals, colourants, preservatives, poison metals etc.	To prevent food adulteration	Section 2: Definitions Section 5: Prohibition of import of certain articles of food Section 7: Prohibition of manufacture, sale etc., of certain articles of food Section 15: Notification of food poisoning Section 16: Penalties	Effective

S. No.	Legal Instrument (Type, Reference, Year)	Responsible Ministries or Bodies	Chemical Use Categories/ Chemical By-products	Objective of Legislation	Relevant Articles/Provisions	Enforcement Status
38	The Prevention of Food Adulteration Rules, 1955	Ministry of Health and Family Welfare	All food-grade chemicals, colourants, preservatives, poison metals etc.	To prevent food adulteration	Section 2: Definitions Part VI: Colouring matter Part X: Preservatives Part XI: Poisonous metals Part XIA: Crop contaminants and naturally occurring toxic substances Part XII: Anti-oxidants, emulsifying and stabilising and anti-caking agents Part XIII: Flavouring agents and related substances Part XIII-A: Carry over of food additives Part XVI: Sequestering and buffering agents (acids, bases and salts) Part XVIII: Antibiotic and other pharmacologically active substances Part XIX: Use of food additives in food products	Effective
39	The Prevention of Terrorism Act, 2002	Ministry of Home Affairs	All substances of hazardous nature including flammable, explosive or toxic substances	To prevent and deal with terrorist activities	Section 2: Definitions Chapter II: Punishment for, and measures for dealing with, terrorist activities	Effective

Table 56: Overview of Legal Instruments to Manage Chemicals by Use Category

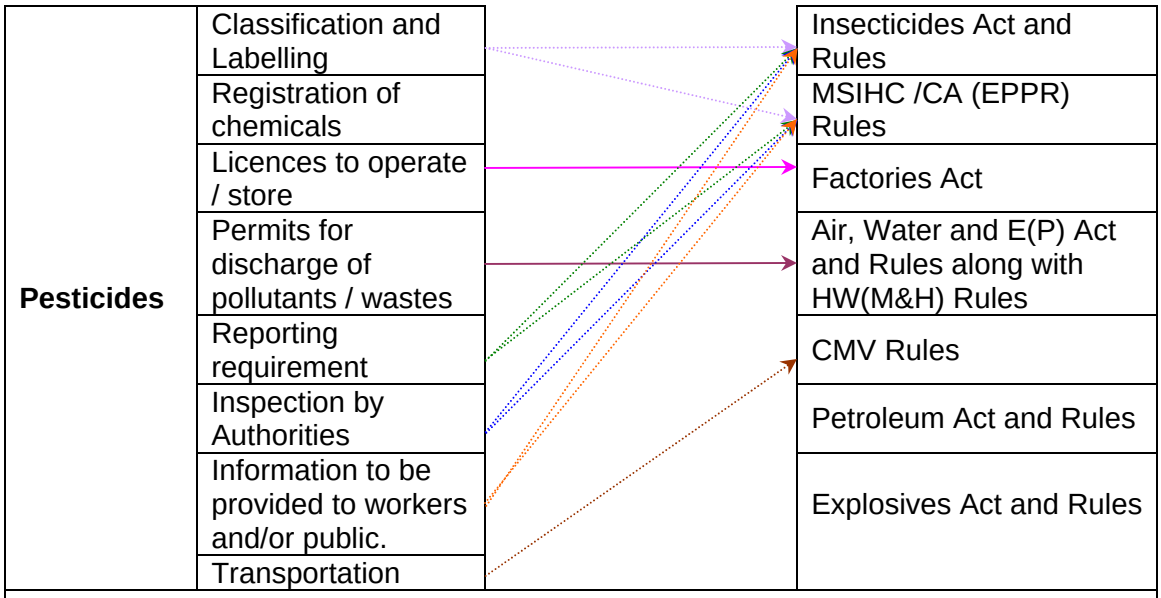
Category of Chemical	Import	Production	Storage	Transport	Distribution / Marketing	Use/Handling	Disposal	Relevant Legal Instruments
Pesticides	X	X	X	X	X	X	X	➲ The Insecticides Act, 1968 ➲ The Insecticides Rules, 1971 ➲ Manufacture Storage and Import of Hazardous Chemicals Rules, 1989 amended 1994 and 2000 ➲ Factories Act, 1948, Water Act, 1974, Air Act, 1981 ➲ The Central Motor Vehicles Rules, 1989 ➲ Hazardous Wastes (Management and Handling) Rules, 1989 amended 2000 and 2003 ➲ Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 ➲ Public Liability Insurance Act, 1991 amended 1992 ➲ Public Liability Insurance Rules, 1991 amended 1993
Fertilisers	X	X	X	X	X	X	X	➲ Manufacture Storage and Import of Hazardous Chemicals Rules, 1989 amended 1994 and 2000 ➲ Factories Act, 1948, Water Act, 1974, Air Act, 1981, Petroleum Act, 1974, Explosive Act, 1884 ➲ The Central Motor Vehicles Rules, 1989 ➲ Hazardous Wastes (Management and Handling) Rules, 1989 amended 2000 and 2003 ➲ Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 ➲ Public Liability Insurance Act, 1991 amended 1992 ➲ Public Liability Insurance Rules, 1991 amended 1993
Industrial Chemicals (Basic organic and inorganic chemicals)	X	X	X	X	X	X	X	➲ Manufacture Storage and Import of Hazardous Chemicals Rules, 1989 amended 1994 and 2000 ➲ Factories Act, 1948, Water Act, 1974, Air Act, 1981 ➲ The Central Motor Vehicles Rules, 1989 ➲ Hazardous Wastes (Management and Handling) Rules, 1989 amended 2000 and 2003 ➲ Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 ➲ Public Liability Insurance Act, 1991 amended 1992 ➲ Public Liability Insurance Rules, 1991 amended 1993

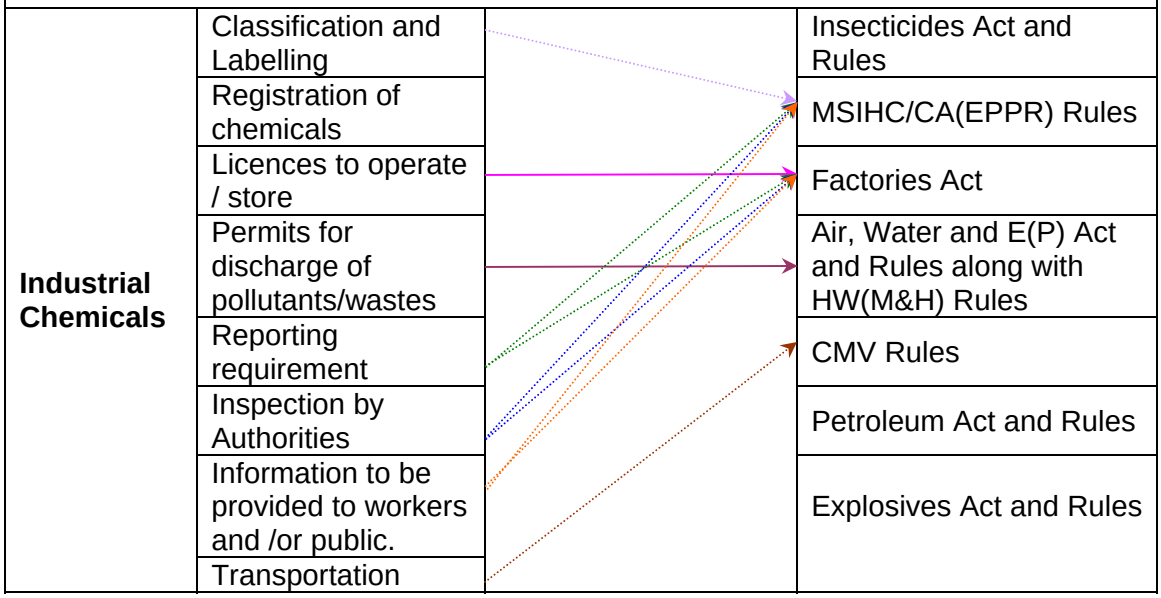
Category of Chemical	Import	Production	Storage	Transport	Distribution / Marketing	Use/Handling	Disposal	Relevant Legal Instruments
Industrial Chemicals (synthetic - bulk drugs, dyes, paints etc.)	X	X	X	X	X	X	X	➲ Manufacture Storage and Import of Hazardous Chemicals Rules, 1989 amended 1994 and 2000 ➲ Factories Act, 1948, ➲ Water Act, 1974, Air Act, 1981, ➲ Petroleum Act, 1974, ➲ Explosive Act, 1884 ➲ The Central Motor Vehicles Rules, 1989 ➲ Hazardous Wastes (Management and Handling) Rules, 1989 amended 2000 and 2003 ➲ Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 ➲ Public Liability Insurance Act, 1991 amended 1992 ➲ Public Liability Insurance Rules, 1991 amended 1993, Drug Control Act
Petroleum Products	X	X	X	X	X	X	X	➲ The Petroleum Act, 1934 ➲ The Petroleum Rules, 2002 ➲ The Explosives Act, 1884 ➲ The Explosive Rules, 1983 ➲ The Static and Mobile Pressure Vessels (Unfired) Rules, 1981 ➲ Manufacture Storage and Import of Hazardous Chemicals Rules, 1989 amended 1994 and 2000 ➲ Factories Act, 1948 ➲ The Central Motor Vehicles Rules, 1989 ➲ Hazardous Wastes (Management and Handling) Rules, 1989 amended 2000 and 2003 ➲ Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 ➲ Public Liability Insurance Act, 1991 amended 1992 ➲ Public Liability Insurance Rules, 1991 amended 1993
Chemicals Wastes	X	X	X	X	X	X	X	➲ Factories Act, 1948 ➲ Air Act, 1981 and Water Act, 1974 as amended ➲ The Central Motor Vehicles Rules, 1989 ➲ Hazardous Wastes (Management and Handling) Rules, 1989 amended 2000 and 2003 ➲ E (P) Act, 1986

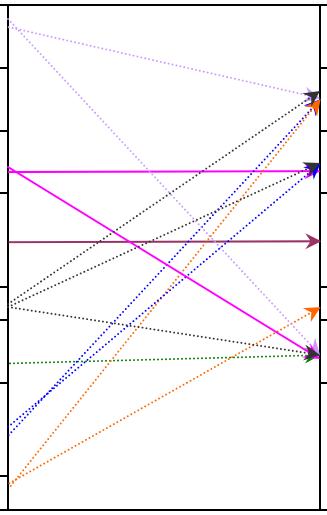
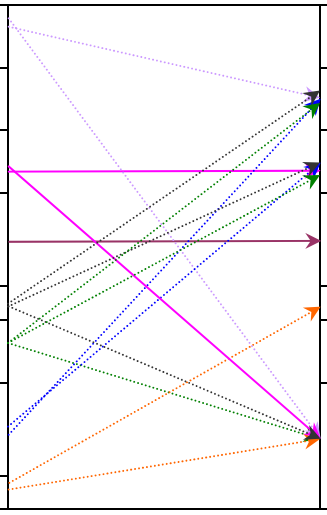
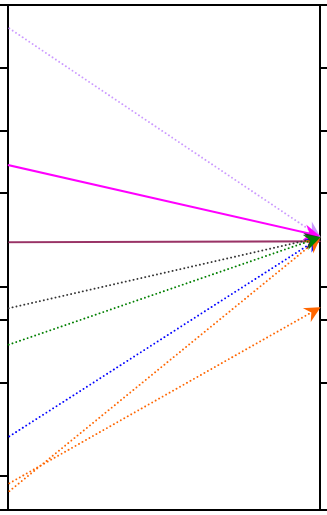
Category of Chemical	Import	Production	Storage	Transport	Distribution / Marketing	Use/Handling	Disposal	Relevant Legal Instruments
Consumer Chemicals (pharmaceuticals, cosmetics, food chemicals etc.)	X	X	X	X	X	X	X	➲ Manufacture Storage and Import of Hazardous Chemicals Rules, 1989 amended 1994 and 2000 ➲ Factories Act, 1948 ➲ The Central Motor Vehicles Rules, 1989 ➲ Hazardous Wastes (Management and Handling) Rules, 1989 amended 2000 and 2003 ➲ Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 ➲ Public Liability Insurance Act, 1991 amended 1992 ➲ Public Liability Insurance Rules, 1991 amended 1993 ➲ Ozone Depleting Substances (Regulation and Control) Rules, 2000 ➲ Drugs & Cosmetics Act, 1940 and Prevention of Food Adulteration Act, 1954

4.5 Summary Description of Key Approaches and Procedures for Control of Chemicals

Different legal instruments address issues at different stages of chemical life cycle such as classification and labelling of chemicals/products, registration of products, permits (e.g. for discharge), licences (e.g. to operate), reporting requirements, inspections, information to be provided to workers and/or the public etc. These have already been discussed in Sections 4.2 and 4.3. To further elaborate on this issue, following self-explanatory charts will show the linkages of stages of chemical life cycles and how they are covered in various legal instruments.





Petroleum Products	Classification and Labelling		Insecticides Act and Rules
	Registration of chemicals		MSIHC/CA(EPPR) Rules
	Licences to operate / store		Factories Act
	Permits for discharge of pollutants/wastes		Air, Water and E(P) Act and Rules along with HW(M&H) Rules
	Reporting requirement		CMV Rules
	Inspection by Authorities		Petroleum Act and Rules
	Information to be provided to workers and /or public.		Explosives Act and Rules
	Transportation		
Explosives	Classification and Labelling		Insecticides Act and Rules
	Registration of chemicals		MSIHC/CA(EPPR) Rules
	Licences to operate / store		Factories Act
	Permits for discharge of pollutants/wastes		Air, Water and E(P) Act and Rules along with HW(M&H) Rules
	Reporting requirement		CMV Rules
	Inspection by Authorities		Petroleum Act and Rules
	Information to be provided to workers and /or public.		Explosives Act and Rules
	Transportation		
Chemical Wastes	Classification and Labelling		Insecticides Act and Rules
	Registration of chemicals		MSIHC/CA(EPPR) Rules
	Licences to operate / store		Factories Act
	Permits for discharge of pollutants/wastes		Air, Water and E(P) Act and Rules along with HW(M&H) Rules
	Reporting requirement		CMV Rules
	Inspection by Authorities		Petroleum Act and Rules
	Information to be provided to workers and /or public.		Explosives Act and Rules
	Transportation		

4.5.1 Banned or Severely Restricted Chemicals

Central Insecticides Board and Registration Committee (CIBRC) have been constituted under the Insecticides Act. They come under Department of Agriculture and Cooperation, Ministry of Agriculture and are responsible for effective implementation of The Insecticides Act and the Rules. CIBRC have banned certain pesticide formulations, refused registration of some products and also prepared a list of pesticides for restricted use in country, which are tabulated in **Table 57.**

Table 57: List of Pesticides / Pesticides Formulations in India

A.	**Pesticides Banned for manufacture, import and use (25 Nos.)**			
	1	Aldrin	14	Pentachloro Nitrobenzene
	2	Benzene Hexachloride	15	Pentachlorophenol
	3	Calcium Cyanide	16	Phenyl Mercury Acetate
	4	Chlordane	17	Sodium Methane Arsonate
	5	Copper Acetoarsenite	18	Tetradifon
	6	Dibromochloropropane	19	Toxafen
	7	Endrin	14	Aldicarb
	8	Ethyl Mercury Chloride	21	Chlorobenzilate
	9	Ethyl Parathion	22	Dieldrin
	10	Heptachlor	23	Maleic Hydrazide
	11	Menazone	24	Ethylene Dibromide
	12	Nitrofen	25	TCA (Trichloro acetic acid)
	13	Paraquat Dimethyl Sulphate		
B.	**Pesticides / Pesticide formulations banned for use but their manufacture is allowed for export (2 Nos.)**			
	1	Nicotin Sulphate		
	2	Captafol 80% Powder		
C.	**Pesticide formulations banned for import, manufacture and use (4 Nos.)**			
	1	Methomyl 24% L	3	Phosphamidon 85% SL
	2	Methomyl 12.5% L	4	Carbofuran 50% SP
D	**List of Pesticides Refused Registration**			
	1	Calcium Arsonate	10	Azinphos Ethyl
	2	EPM	11	Binapacryl
	3	Azinphos Methyl	12	Dicrotophos
	4	Lead Arsonate	13	Thiodemeton / Disulfoton
	5	Mevinphos (Phosdrin)	14	Fentin Acetate

	6	2,4, 5-T	15	Fentin Hydroxide
	7	Carbophenothion	16	Chinomethionate (Morestan)
	8	Vamidothion	17	Ammonium Sulphamate
	9	Mephosfolan	18	Leptophos (Phosvel)
E	**Pesticides Restricted for Use in India**			
	1	Aluminium Phosphide	5	Methyl Parathion
	2	DDT	6	Sodium Cyanide
	3	Lindane	7	Methoxy Ethyl Mercury Chloride (MEMC)
	4	Methyl Bromide		

Source: Department of Agriculture & Cooperation, Ministry of Agriculture

In addition, use of carcinogenic azo and benzidine dyes is also banned in India. The Ministry of Environment and Forests, Government of India has prohibited the handling of benzidine based dyes vide of January 1990. As per this notification, handling of all the 42 benzidine based dyes are prohibited from 1993 onwards. These are related to banned amines listed in **Table 58.**

Table 58: List of Benzidine based dyes prohibited from 1993

S. No.	CI Generic Name	CI Constn. No.	S. No.	CI Generic Name	CI Constn. No.
1.	Acid Orange 45	22195	22	Direct Green 1	30280
2.	Acid Red 85	22245	23.	Direct Green 6	30295
3.	Acid Black 29	-	24.	Direct Green 8	30315
4.	Acid Black 94	30336	25.	Direct Green 8:1	--
5.	Azoic Diazo Compo.112	37225	26.	Direct Brown 1	30045
6.	Direct Yellow 1	22250	27.	Direct Brown 1:2	30110
7.	Direct Yellow 24	22010	28.	Direct Brown 2	22311
8.	Direct Orange 1	22370	29.	Direct Brown 6	30140
9.	Direct Orange 8	22130	30.	Direct Brown 25	36030
10.	Direct Red 1	22310	31.	Direct Brown 27	31725
11.	Direct Red 10	22145	32.	Direct Brown 31	35660
12.	Direct Red 13	22153	33.	Direct Brown 33	35520
13.	Direct Red 17	22150	34.	Direct Brown 51	31710
14.	Direct Red 28	22120	35.	Direct Brown 59	22345
15.	Direct Red 37	22240	36.	Direct Brown 79	30056
16.	Direct Red 44	22500	37.	Direct Brown 95	30145
17.	Direct Violet 1	22570	38.	Direct Brown 101	31740
18.	Direct Violet 12	22550	39.	Direct Brown 154	30120
19.	Direct Violet 22	22480	40.	Direct Black 4	30245
20.	Direct Blue 2	22590	41.	Direct Black 29	22580
21.	Direct Blue 6	22610	42.	Direct Black 38	30235

The Ministry of Environment and Forests has further prohibited the handling of 70 more azo dyes which came under the banned category as per the notification published in the Gazette on 26th March, 1997. Thus, the Ministry of Environment and Forests has prohibited the handling of 42+70=112 dyes which are capable of releasing any of the harmful amines listed in **Table 59.**

Table 59: List of Azo dyes prohibited from June 1997

S. No.	CI Generic Name	CI Constn. No.	S. No.	CI Generic Name	CI Constn. No.
1	Acid Red 4	14710	36	Direct Red 26	29190
2	Acid Red 5	14905	37	Direct Red 39	23630
3	Acid Red 24	16140	38	Direct Red 46	23050
4	Acid Red 26	16150	39	Direct Red 62	29175
5	Acid Red 73	27290	40	Direct Red 67	23505
6	Acid Red 114	23635	41	Direct Red 72	29200
7	Acid Red 115	27200	42	Direct Violet 21	23520
8	Acid Red 116	26660	43	Direct Blue 1	24410
9	Acid Red 128	24125	44	Direct Blue 3	23705
10	Acid Red 148	26665	45	Direct Blue 8	24140
11	Acid Red 150	27190	46	Direct Blue 9	24155
12	Acid Red 158	20530	47	Direct Blue 10	24340
13	Acid Red 167	--	48	Direct Blue 14	23850
14	Acid Red 264	18133	49	Direct Blue 15	24400
15	Acid Red 265	18129	50	Direct Blue 22	24280
16	Acid Red 420	--	51	Direct Blue 25	23790
17	Acid Violet 12	18075	52	Direct Blue 35	24145
18	Acid Brown 415	--	53	Direct Blue 53	23860
19	Acid Black 131	--	54	Direct Blue 76	24411
20	Acid Black 132	--	55	Direct Blue 151	24175
21	Acid Black 209	--	56	Direct Blue 160	--
22	Basic Red 111	--	57	Direct Blue 173	--
23	Basic Red 42	--	58	Direct Blue 192	--
24	Basic Brown 4	21010	59	Direct Blue 201	--
25	Oxidation Base 20	76035	60	Direct Blue 215	24115
26	Direct Yellow 48	23660	61	Direct Blue 295	23820
27	Direct Orange 6	23375	62	Direct Green 85	30387
28	Direct Orange 7	23380	63	Direct Blue 222	30368
29	Direct Orange 10	23370	64	Direct Black 91	30400
30	Direct Orange 108	29173	65	Direct Black 154	--
31	Direct Red 2	23500	66	Disperse Yellow 7	26090
32	Direct Red 7	24100	67	Disperse Yellow 23	26070
33	Direct Red 21	23560	68	Disperse Yellow 56	--
34	Direct Red 22	23565	69	Disperse Orange 149	--
35	Direct Red 24	29185	70	Disperse Red 151	26130

4.6 Non-regulatory Mechanism for Managing Chemicals

Non-regulatory Mechanisms play a very important role in management of chemicals in India. Industries take several initiatives for environmental protection and chemical management, such as Responsible Care, Corporate Responsibility in Environmental Planning (CREP), ISO 14001, OHSAS 18001, ISRS, Eco Mark etc. Additionally, several awards related to chemical and environmental management are initiated on voluntary basis by industrial associations, who play an important role in encouraging industries to go for non-regulatory mechanisms. Important industrial associations include

- Indian Chemical Council (ICC) (formerly the ICMA – Indian Chemical Manufacturer's Association)
- Confederation of Indian Industry (CII)
- Federation of Indian Chambers of Commerce and Industry (FICCI)

4.6.1 Voluntary Action by Industry

Some of important voluntary actions by industry are discussed below:

Responsible Care programmes

Responsible Care (R) programme, originally initiated by the Canadian Chemical Producers Association (CCPA) has now been adopted by the most of the developed and developing nations. The programme rests upon the two major fundamentals. It is necessary to look beyond the law to prevent all the accidents, and the Second and the foremost is that the society has certain expectations from the chemical industry as a Corporate Citizen. The concern for the society has to be paramount in the entire gamut of Safety, Health & Environment (SHE) Management.

The booklet "Responsible Care(R) A Public Commitment", published by the Indian Chemical Manufacturers Association, is being followed as a guide for the programme by all the signatories, since the adoption of this programme by ICC since 1993.

At present there are 79 signatories to the programme. ICC initiates action for helping the signatories in compliance as well as assessing their level of compliance.

Declaration of an award by the Aditya Birla Group, to the best compliant, under Responsible Care (R) has given much-needed boost to this programme. Already some of the signatories have communicated their willingness for getting audited,

either as a requirement for obtaining the Responsible Care (R) logo, or for competing for the award. Modalities for these awards are under the active consideration of the association and very soon it will come out with the specifics.

There are item-wise guidelines for following four codes:

- ✓ Process Safety
- ✓ Employee Health & Safety
- ✓ Pollution Prevention
- ✓ Emergency Response

ISO 14001 / OHSAS 18001

ISO 14001, established in 1996 and revised in 2004, is a voluntary international standard focussing on the systemic management of an organisation's environmental impacts. Establishing an Environmental Management System (EMS) can positively influence the effectiveness of a site's EHS programme and provide long-term reduction of pollution. OHSAS 18001, released in 2000, is a voluntary international standard focusing on the systemic management of an organisation's occupational health and safety system. An Occupational Health and Safety Management System (OHSMS) uses risk assessment as a prime basis for prioritising health and safety program improvement goals. In addition, activities, such as accident investigation, are formalised and tracked to evaluate trends and support corrective action efforts. These international standards for environment and safety are being adopted by all types of enterprises in the country, as part of their voluntary initiatives to meet and demonstrate commitments towards environment, health and safety. A large number of large, medium and small scale enterprises has adopted these standards and are certified by accredited international certification bodies.

ISI Marking

The Indian Standards Institution (ISI) was set up in 1947 as a registered society, under a Government of India resolution to give the standards for industrial and commercial growth, quality production and competitive efficiency. In 1986, it was changed to Bureau of Indian Standards (BIS) for building the climate of quality culture and consciousness and greater participation of consumers in formulation and implementation of National Standards.

The product certification scheme of BIS is basically voluntary and aims at providing quality, safety and dependability to the ultimate customer. Presence of certification mark known as Standard Mark on a product is an assurance of conformity to the specifications. The conformity is ensured by regular

surveillance of the licensee's performance by surprise inspections and testing of samples, drawn both from the factory and the market.

Besides the normal product certification scheme, BIS also grants licences to environment friendly products under a special scheme and awards the ECO MARK to such products. These products should conform to additional requirements specified in the Indian Standards to qualify.

Agmark

The scheme is for promotion of Grading and Standardisation of agricultural and allied commodities under Agricultural Produce (Grading & Marking) Act, 1937. Quality standards for agricultural commodities are framed based on their intrinsic quality. Food safety factors are incorporated in the standards to compete in World trade. Standards are harmonised with international standards keeping in view the WTO requirements. Certification of agricultural commodities is carried out for the benefit of producer / manufacturer and consumer. Certification of adulteration prone commodities viz. Butter, Ghee, Vegetable Oils, Ground-Spices, Honey, Wheat, etc. is very popular. Blended Edible Vegetable Oils and Fat Spread are compulsorily required to be certified under Agmark. Check is kept on the quality of certified products through 23 laboratories and 43 offices spread all over the country.

Corporate Responsibility for Environmental Protection (CREP)

Central Pollution Control Board (CPCB) has formulated the Charter on Corporate Responsibility for Environmental Protection (CREP) through industry-specific interaction meetings. These charters are aimed at going beyond compliance through adoption of clean technologies and improvement in management practices. Commitment and voluntary initiatives of industry for responsible care of the environment will help in building a partnership for pollution control. The Charter is a commitment for partnership and participatory action of the concerned stakeholders. The Charter is also a road map for progressive improvement in environmental management systems. Thus, it is not necessarily limited to compliance of end-of-the-pipe effluent and emission standards. In a number of industrial sectors, the targets set in the Charter are ahead of effluent and emission standards.

4.6.2 Economic Incentives

The Govt. of India has been operating an Incentive Scheme of reimbursement of expenses of acquiring Quality Management System (QMS) ISO-9000 certification in the Small Scale Sector to the extent of 75% of the amount limited to Rs. 75,000/- to each unit. The scope of this Scheme now has been extended to provide reimbursement of expenses of acquiring EMS – ISO 14001 Certificate. The Scheme is valid till March 31, 2007. The Permanent Registered Small Scale

/ ancillary / Tiny / Small Scale Service Business Enterprises (SSSBE) units are eligible to avail the Incentive Scheme. It is an all India Scheme administered by Development Commissioner (SSI), Ministry of SSI, Govt. of India. A Screening Committee under the Chairmanship of AS&DC (SSI) has been set up to consider the applications for approval of reimbursement.

4.7 Comments / Analysis

- Close examination of database discussed in Chapter 4 indicates that India has enough legislation to regulate chemical use, storage, transportation, import, production, waste disposal etc. There is not much overlap among the various legislations, except for a few cases where harmonisation is required. There is non-uniformity in the list of hazardous chemicals addressed by different legislation for different aspects of chemical handling. Chemicals/criteria listed in MSIHC Rules, CA (EPPR) rules, Factories Act and CMV Rules are not uniform. Further, definitions/criteria for flammability in MSIHC and Petroleum rules are also different. It is also observed that the degree of legislations for controlling/regulating chemicals is less in case of consumer chemicals including food products in comparison to other sections.

- Some of the issues, which are important, are still not addressed by various legislations related to chemical management in the country. These include:

    - Large scale storage of Cryogenic substances;

    - Long distance pipelines for hydrocarbon and non-hydrocarbons; and

    - Containment and non-containment explosives

- With respect to effectiveness of the enforcement, it is observed the entire legislation can be classified into four groups – highly effective, effective, fair and weak. The major drawbacks with respect to effectiveness in case of fair categories are Inspection and Vigilance and Public Awareness. This is mainly due to the limitation of inspectors in the respective departments. This can be overcome if government can enhance the number of inspectors or legitimises the professionals / consultants through accreditation system for auditing. In case of public awareness, the services of the NGOs may be explored.

- There are various non-regulatory mechanisms, voluntary programmes, incentive systems, in reducing chemical risks and their effectiveness varies from industry to industry. Generally these are more effective in large scale industries that have more resources to implement and

maintain such systems. On the other hand, such systems are not found to be very effective on long-term basis in various smaller units.

- So far no new Acts are proposed for enactment in the area of chemical management in near future; however, a national policy on environment is proposed to come. Policy is already drafted by the Ministry of Environment & Forests and is being discussed and finalised.

- There are some regulations which are the direct result of international convention and agreements such as:

    - Hazardous Waste (Management and Handling) Rules, 1989 amended 2000 and 2003 – based on the Basel Convention

    - Ozone Depleting Substances (Regulation and Control) Rules, 2000 – based on the Montreal Protocol

CHAPTER 5

MINISTRIES, AGENCIES AND OTHER INSTITUTIONS MANAGING CHEMICALS

5.1 Background

Governmental structure in India related to chemical management is well defined. Responsibilities of various ministries, agencies and other bodies under them in management of various aspects of chemicals during different stages or for categories of chemicals are defined in various legal instruments. By the Acts enacted by the parliament institutions are created under ministries for specific objectives to manage chemicals, their authorities and responsibilities are defined along with powers for effective management.

This chapter gives an overview of important ministries, agencies or institutions related to chemical management along with their responsibilities, authorities and mandate.

5.2 Responsibility of Different Government Ministries, Agencies and Other Institutions

General overview of ministerial responsibilities and activities related to chemical management for each stage of chemical life cycle from production / import through disposal are given in **Table 60**. The overview will assist in documenting areas currently covered and in identifying missing elements or possible overlaps in the national institutional infrastructure.

Table 59 lists nine important ministries / agencies dealing with various categories of chemicals and / or different stages of chemical life cycle along with their responsibilities in brief. Seven different stages of chemical life cycle have been identified and are listed in top row. Role of each ministry / agency is assessed at every stage of chemical life cycle and rating is given based on +++, ++, or + indicating primary role, secondary role and tertiary role. A blank cell indicates ministry / agency does not play any role for that particular stage in chemical life cycle.

As can be seen from the Table, all the stages are adequately covered under mandates of various ministries/agencies. There appears to be some overlap in the mandate as against same stage primary role is indicated for more than one ministry / agency. However, this in general is due the fact that certain ministries / agencies have mandates as per categories of chemicals rather than for stages of life cycle and it is vice versa for another ministry / agency indicating more than one primary responsible player.

Table 60: Extent of Statutory Provisions of Ministries, Agencies and Other Institutions

Ministry / Agency Concerned	Importation	Production	Storage	Transport	Marketing	Use / Handling	Disposal	Major Responsibilities
Central Insecticides Board and Registration Committee, Department of Agriculture and Cooperation, Ministry of Agriculture	++	+++	+++	+++	+++	+++	+	Implementation of The Insecticides Act, 1968 and The Insecticides Rules, 1971
Department of Chemicals and Petrochemicals, Ministry of Chemicals and Fertilisers	+++	+++	+	+	++	++		Responsibility includes policy, planning, development and regulation of Chemicals, Petrochemicals and Pharmaceuticals Industries
Department of Fertilisers, Ministry of Chemicals and Fertilisers	+++	+++	++	+	+++	++		The main activities of the Department of Fertilisers (DOF) include planning, promotion and development of the fertiliser industry, planning and monitoring of production, import and distribution of fertilisers and management of financial assistance for indigenous and imported fertilisers.
Department of Explosives, Department of Industrial Policy and Promotion, Ministry of Commerce and Industries	+++	+++	+++	+++	++	+++	++	The Explosives Act, 1884 and The Explosive Rules, 1983; The Petroleum Act, 1934 and The Petroleum Rules, 2002; The Gas Cylinder Rules, 2004;The Static and Mobile Pressure Vessels (Unfired) Rules, 1981
Ministry of Environment and Forests	++	+++	+++	++		+++		Implementation of Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 and Chemical Accidents Emergency Planning Preparedness and Response Rules, 1996

Ministry / Agency Concerned	Importation	Production	Storage	Transport	Marketing	Use / Handling	Disposal	Major Responsibilities
Central Board of Excise and Customs, Ministry of Finance	+++		+++			+	+	CBEC deals with the tasks of formulation of policy concerning levy and collection of Customs and Central Excise duties, prevention of smuggling and administration of matters relating to Customs, Central Excise and Narcotics to the extent under CBEC's purview
DGFASLI, DISH/CIF, Ministry of Labour		+++	++			+++		Factories Act and Rules
Department of Road Transport and Highways, Ministry of Shipping, Road Transport and Highways				+++				CMV Act and Rules covering transportation of Hazardous Chemicals
Ministry of Petroleum and Natural Gas	+++	+++	+++	++	+++	+++		The Ministry of Petroleum & Natural Gas has the responsibility of exploration and production of oil and natural gas, their refining, distribution and marketing, import, export, and conservation of petroleum products and Liquefied Natural Gas.
Ministry of Railways			++	+++				Transportation of Hazardous Chemicals through rail and storage at railway godowns

5.3 Description of Ministerial Authorities and Mandates

5.3.1 Ministry of Agriculture

Ministry of Agriculture comprises the following Departments:

- ❖ Department of Agriculture and Cooperation,
- ❖ Department of Agricultural Research & Education and
- ❖ Department of Animal Husbandry & Dairying

The *Department of Agriculture and Cooperation* is responsible for the formulation and implementation of National policies and programmes aimed at achieving rapid agricultural growth through optimum utilisation of the country's land, water, soil and plant resources. The Department undertakes all possible measures to ensure timely and adequate supply of inputs and services such as fertilisers, seeds pesticides, and agricultural implements and also provides agricultural credit, crops insurance and ensures remunerative returns to the farmer for his agricultural produce. The Department is entrusted with the responsibility of collection and maintenance of a wide range of statistical and economic data relating to agriculture, required for development planning, organising agricultural census, assisting and advising the States in undertaking scarcity relief measures and in management of natural calamities e.g. flood, drought, cyclone, etc.

The comprehensive Insecticides Act was passed in 1968 to regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent the risks to human beings and animals and for other matters connected therewith. The responsibility for enforcement of Act was transferred to the Ministry of Agriculture in the year 1970 by the Ministry of Health and Family Planning, who took immediate steps to frame the Rules and constituted the Central Insecticides Board and Registration Committee. In the Act and the Rules framed there under, there is compulsory registration of the pesticides at the Central level and license for their manufacture; formulation and sale are dealt with at the State level. With the enforcement of the Insecticides Act in the country pesticides of very high quality are made available to the farmers and general public for house-hold use, for protecting the agricultural crops from the ravages of their pests, humans from diseases and nuisance caused by public health pests and the health hazards involved in their use have been minimised to a great extent.

5.3.1.1 Central Insecticides Board

The Central Insecticides Board advises the Central Government and State Governments on technical matters arising out of the administration of this Act and to carry out the other functions assigned to the Board by or under this Act. The matter on which the Board may advise includes:

a) The risk to human being or animals involved in the use of insecticides and the safety measures necessary to prevent such risk;

b) The manufacture, sale, storage, transport and distribution of insecticides with a view to ensure safety to human beings or animals;

Functions of the Board include:

- Advise the Central Government on the manufacture of insecticides;
- Specify the uses of the classification of insecticides on the basis of their toxicity as well as their being suitable for aerial application;

- Advice tolerance limits for insecticides residues and establishment of minimum intervals between the application of insecticides and harvest in respect of various commodities;
- Specify the shelf-life of insecticides;
- Suggest colourisation, including colouring matter that may be mixed with concentrates of insecticides, particularly those of highly toxic nature; and
- Carry out such other functions as are supplemental, incidental or consequential to any of the functions conferred by the Act or the Rules.

5.3.2 Ministry of Chemicals and Fertilisers

Ministry of Chemicals and Fertilisers comprises the following Departments:

- Department of Chemicals & Petrochemicals and,
- Department of Fertilisers

*5.*3.2.1 Department of Chemicals & Petrochemicals

The Department of Chemicals & Petrochemicals has been part of the Ministry of Chemicals and Fertilisers since 1991. The Department is entrusted with the responsibility of policy, planning, development and regulation of Chemicals, Petrochemicals and Pharmaceuticals Industries. The business allocated to the Department is listed as below:

- Insecticides [excluding the administration of Insecticides Act, 1968 (48 of 1968)];
- Molasses;
- Alcohol - industrial and potable (excluding Alcoholic drinks from non-molasses base).
- Dye-stuffs and dye-intermediates.
- All organic and inorganic chemicals not specifically allotted to any other Ministry or Department.
- Planning, development and control of and assistance to all industries dealt with by the Department.
- All attached or subordinate offices or other organisations with any of the subjects specified under this Department.
- Public Sector projects concerned with the subjects included under this Department except such projects as are specifically allotted to any other Ministry or Department.
- Bhopal Gas Leak Disaster-Special laws relating thereto
- Petrochemicals
- Industries relating to production of non-cellulosic synthetic fibres (Nylon, Polyester, Acrylic etc.)

- Synthetic Rubber
- Plastic including fabrications of plastic and moulded goods
- All public sector units relating to the above matters
- All attached and subordinate offices or other organisations concerned with any of the subjects specified in this list.

5.3.2.2 Department of Fertilisers

Department of Fertilisers comes under the ambit of Ministry of Chemicals and Fertilisers. This Department was earlier used to be named as Department of Chemicals & Fertilisers. The genesis of the Department of Chemicals and Fertilisers can be traced to the erstwhile Ministry of Production in the fifties. During that time, while "Fertiliser" subject was being dealt as a part of the Section, the subject matter of "Chemicals" was assigned to Ministry of Commerce and Industry.

The importance of the fertiliser and chemical sectors was recognised in 1963 when the subjects concerned were placed in one Department in the newly set up Ministry of Petroleum and Chemicals. In 1975, with the appointment of a separate Cabinet Minister for Chemicals & Fertilisers, the Ministry of Chemicals & Fertilisers comprising the Department of Petroleum and the Department of Chemicals & Fertilisers came into being.

The Ministry of Chemicals & Fertilisers came into existence in September, 1982 headed by a Cabinet Minister who is assisted by the Minister of State. It was part of the Ministry of Agriculture till 1984. In June, 1991, it became a part of the newly created Ministry of Chemicals & Fertilisers. Department of Fertilisers came into existence as a separate Department in September, 1985 consequent upon the bifurcation of the then Ministry of Chemicals & Fertilisers. Thereafter, this Department was brought under the ambit of Ministry of Agriculture for a short duration. However, the earlier position was restored in 1992.

The main activities of the Department of Fertilisers (DOF) include planning, promotion and development of the fertiliser industry, planning and monitoring of production, import and distribution of fertilisers and management of financial assistance for indigenous and imported fertilisers.

The Department is broadly divided into four divisions dealing with (i) Fertiliser Projects and Planning (ii) Fertiliser Imports, Movement and Distribution (iii) Administration and (iv) Finance and Accounts. The work of first three divisions is handled by two Joint Secretaries. Joint Secretary (Fertilisers) is entrusted with the work pertaining to planning, production and development of fertiliser industry, which includes Retention Price Scheme (RPS), joint ventures, external assistance for new fertiliser projects, revival of sick fertiliser units, company affairs and issues relating to raw materials such as natural gas, fuel oil and naphtha. Besides, one post of Economic Adviser, has recently been created who advices the department on various economic issues like creation of additional capacity, pricing and costing of fertilisers.

5.3.3 Ministry of Commerce and Industry

Ministry of Commerce and Industry has the two following main divisions and six sub-divisions viz.

a) Department of Commerce

- ✓ Directorate General of Commercial Intelligence and Statistics
- ✓ Directorate General of Foreign Trade
- ✓ Directorate General of Supplies & Disposals (DGS&D)

b) Department of Industrial Policy & Promotion

- ✓ Office of the Economic Adviser
- ✓ Department of Explosives
- ✓ Tariff Commission

5.3.3.1 Department of Explosives

The Department of Explosives with its Head Office at Nagpur has completed its hundred years on 9th September 1998. The Department has come a long way in achieving necessary expertise in consonance with industrial growth of the country. Department of Explosives is under, Ministry of Commerce and Industry, Department of Industrial Policy & Promotion.

The activities of the Department involving administration of the Acts and Rules noted above are described below in brief:

- ❖ Scrutiny and approval of site, layout and construction plans for:
  - ➢ Explosives manufacturing factories;
  - ➢ Explosives storage premises;
  - ➢ Manufacture of explosives at site in Bulk Mixing and Delivery Vehicles
  - ➢ Public display of Fireworks;
  - ➢ Storage sheds for filled gas cylinders;
  - ➢ Filling plants for gas cylinders;
  - ➢ Storage installations for compressed gases in unfired pressure vessels;
  - ➢ Petroleum storage installations, storage sheds and service stations; and
  - ➢ Calcium Carbide storage premises
- ❖ Scrutiny and approval of design and construction of explosives vans, vehicles for transport of compressed gases in pressure vessels and petroleum tank Lorries;
- ❖ Licensing of the Premises / units / vehicles referred under above points;

- Scrutiny and approval of layout etc. of Petroleum Refineries, Petrochemical units, and Acetylene gas generating plants;

- Scrutiny and approval of designs of unfired pressure vessels and their fittings;

- Type approval of gas cylinders and valves fitted thereto, manufactured in India and imported from outside before authorising their use in the country;

- Scrutiny and approval of flameproof, intrinsically safe and special electrical equipments suitable for use in hazardous areas;

- Approval of factories fabricating pressure vessels and its fittings, gas cylinders valves and LPG regulators;

- Approval of testing stations, for periodic examination and testing of cylinders;

- Recognition of competent persons and inspectors under various rules;

- Regular inspection of the units mentioned above;

- Destruction of deteriorated and unclaimed/seized explosives;

- Examination of petroleum tanks in sea going vessels for issuing gas free certificates before allowing hot work and entry of man in such tanks and entry of such vessels in docks;

- Technical investigation of accidents coming under the purview of the Acts and Rules administered by the department;

- Authorisation of new explosives after adequate tests and trials;

- Grant of license to import, export and transport explosives;

- Grant of permission for filling / use of all gas cylinders imported from abroad and manufactured in India;

- Grant of license for import of cylinders;

- Conducting examination of shot-firers for issuance of permits;

- Scrutiny of returns under various rules;

- Amendment of rules and grant of exemption/relaxation wherever necessary in public interest;

- Training of Police Personnel, Security and other officers in detection/safe handling, etc. of explosives and other dangerous substances;

- Advising Port, Airport and Railway authorities on:
  - Classification of hazardous substances;
  - Packing and determination of conditions for storage/transport of dangerous substances; and
  - Sitting and layout of facilities for the loading / unloading and transit storage of explosives, flammable and other dangerous substances

- Examination / testing of explosives / hazardous substances for classification of hazard;

- Advising the Central and State Government, the Industry and various organisations on matters relating to the handling of explosives, flammable and other dangerous substances, relating to the Acts and Rules referred to above;

- Participation as Chairman or member in various committees appointed by the Ministry of Defence, Bureau of Indian Standards and other Ministries and Departments; and

- Participation in symposiums, seminars, workshops organised by various organisations relating to safety in handling of hazardous chemicals, petroleum products, explosives and compressed gases.

The activities of the Department went on increasing with the growth of Industry. Initially the explosives as well the petroleum requirement of the country were all imported, but now due to the increased number of petroleum refineries and factories manufacturing industrial explosives and introduction of new rules covering pressure vessels and gas cylinders, the number of units licensed / approved by the department have increased tremendously.

The Department contributes regularly to the Ministry of Environment & Forest in its efforts to formulate and implement guideline / regulations for controlling environment pollution and damage by toxic and hazardous chemicals.

The Department of Explosives is the only department of its kind directly overseeing the safety requirements for so many units handling divergent types of hazardous materials and offering technical co-ordination and expertise to so many organisations in private and public sector including Ministry and Autonomous Bodies.

5.3.4 Ministry of Environment & Forests

The Ministry of Environment & Forests is the nodal agency in the administrative structure of the Central Government, for the planning, promotion, co-ordination and overseeing the implementation of environmental and forestry programmes. The Ministry is also the Nodal agency in the

country for the United Nations Environment Programme (UNEP). The principal activities undertaken by Ministry of Environment & Forests consist of conservation & survey of flora, fauna, forests and Wildlife, prevention & control of pollution, afforestation & regeneration of degraded areas and protection of environment, in the frame work of legislations.

The main tools utilised for this include surveys, impact assessment, control of pollution, regeneration programmes, support to organisations, research to solve solutions and training to augment the requisite manpower, collection and dissemination of environmental information and creation of environmental awareness among all sectors of the country's population.

5.3.4.1 Hazardous Substances Management (HSM) Division

The Hazardous Substances Management Division (HSMD) is the nodal point within the Ministry for management of chemical emergencies and hazardous substances. The main objective of the Division is to promote safe management and use of hazardous substances including hazardous chemicals and hazardous wastes, in order to avoid damage to health and environment. The Division is also the nodal point for the following three International Conventions:

- The Basel Convention on the Control of Trans-boundary Movement of Hazardous Wastes and their Disposal;

- The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals & Pesticides in International Trade; and

- The Stockholm Convention on Persistent Organic Pollutants (POPs).

The activities of the division are carried out under three main thrust areas, viz., Chemical Safety; Hazardous Wastes Management and Solid Waste Management. Major programmes / activities are as follows:

a) Chemical Safety

- The Manufacture, Storage and Import of Hazardous Chemical (MSIHC) Rules, 1989 / 2000 and the Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996 are the main instruments for ensuring chemical safety in the country.

- A comprehensive National Chemical Profile assessing the existing institutional, administrative, technical and legal infrastructure vis-à-vis the requirements of safe handling of chemicals in the country is being prepared.

- As on date, there is 1729 Major Accident Hazard Units (MAH) in 22 States / UTs (19 states and 3 UTs). As per the latest information, 1569 on-site Plans and 137 Off-site plans have been prepared. All the states except Bihar and Jammu & Kashmir have constituted State Level Crisis Groups.

- A GIS based Emergency Planning and Response System has been developed for 20 districts clusters in Gujarat, Maharashtra, Tamil Nadu and Andhra Pradesh and extended to cover another 22 districts in the 10 states of NCT- Delhi, Assam, Haryana, West Bengal, Madhya Pradesh, Uttar Pradesh, Karnataka, Punjab, Rajasthan and Kerala.

- Out of 270 districts having MAH Units, 180 have hazard prone industrial pockets. Hazard Analysis studies have been initiated for 107 districts

- An inventorization study on "Isolated Storages" carried out during 2001-02 has identified 347 Isolated Storages in the country.

- Under the Public Liability Insurance Act, 1991 as amended in 1992, all the MAH units handling chemicals in excess of the threshold quantities referred to in the Schedule, are mandated to take an insurance policy and deposit an equal amount in the Environment Relief Fund (ERF) to ensure immediate payment to the chemical accident victims.

b) Hazardous Waste Management

- The legal instruments for management of hazardous wastes are the Hazardous Wastes (Management & Handling) Rules, 1989, amended 2000, the Biomedical Wastes (Management & Handling) Rules, 1998/2000 and the Batteries (Management & Handling) Rules, 2001. Major responsibility for implementing these Rules is with the Central Pollution Control Board and State Pollution Control Boards (SPCBs) / Pollution Control Committees (PCCs) and also with the State Departments of Environment.

- The Hazardous Wastes (Management and Handling) Rules, 1989, amended in 2000 have been further rationalised and revised. Amendment Rules have been notified on 20th May, 2003.

- About 4.4 million tonnes of hazardous wastes are being generated by 13011 units spread over 373 districts of the country (This data is based on the waste categories indicated in the Hazardous Wastes (Management and Handling) Rules, 1989 and is likely to be revised in view of the amendments of 2000). The states of Maharashtra, Gujarat and Tamil Nadu account for over 63% of the total hazardous wastes generated in the country.

- The Batteries (Management & Handling) Rules, 2001 was notified in May, 2001 to regulate the collection, channelisation and recycling as well as import of used lead acid batteries in the country. These rules inter-alia make it mandatory for consumers to return used batteries. All manufacturers / assemblers / reconditioners / importers of lead acid batteries are responsible for collecting used batteries against new ones sold as per a schedule defined in the rules. Such used lead acid batteries can be auctioned / sold only to recyclers registered with the Ministry on the basis of their possessing environmentally sound facilities for recycling / recovery.

- The Biomedical Waste (Management & Handling) Rules were notified in 1998 to regulate the management of wastes generated by Health Care Establishments (HCE) all over the country. Under these Rules, the wastes generated by HCEs are categorised into 10 categories and disposal methods for all the categories of wastes are also specified. The status of implementation of these rules is regularly monitored. Amendments to these rules are being finalised and are likely to be notified shortly.

- As per the Hazardous Wastes (M&H) Rules, 1989/2000 and 2003, all hazardous wastes are required to be treated and disposed off in the manner prescribed. In the absence of common disposal facilities in the country, permission has been granted to the hazardous waste generating units in the small scale sector, for storing their wastes temporarily in a secure, lined pit / facility within their premises. During the Tenth Plan Period it has been decided to focus on the setting up of common Treatment Storage and Disposal Facility (TSDFs) in different parts of the country. While support would be provided for setting up two such common facilities in major hazardous waste generating states, one facility would be supported in other states.

- Subsequent to the notification of the Hazardous Waste (Management & Handling) Amendment Rules on 20th May, 2003, the Registration Scheme, being so far implemented by the Ministry has been transferred to the Central Pollution Control Board (CPCB).

c) Solid Waste Management

- The Municipal Solid Wastes (Management & Handling) Rules, 2000, the Fly Ash Notification, 1999 and the Recycled Plastics (Manufacture & Usage) Rules, 1999 constitute the regulatory frame-work for the management of solid wastes in the country.

- The Recycled Plastics (Manufacture & Usage) Rules, 1999, have been amended and the Recycled Plastics (Manufacture & Usage) Amendment Rules have been notified vide S.O.698(E) dated 17th June, 2003. The salient features include:

- ✓ Plastic carry bags defined.

- ✓ Manufacture, use, stock & sale of carry bags made of virgin or recycled plastic below 8x12 inches in size (as well as below 20 microns thickness) banned

- ✓ Registration of units manufacturing plastic carry bags with SPCB made mandatory.

- ➢ The Fly ash Notification of 4th September 1999 has been amended and the amended Notification has been issued on 27th August, 2003. The salient features include:

  - ✓ Extending the geographical coverage up to a distance of 100 km from Thermal Power Stations

  - ✓ Responsibility on the construction agencies use fly ash based bricks/products in a time bound manner

  - ✓ Time limits prescribed for State Pollution Control Boards to take decisions on the applications for manufacture of fly ash based bricks / products

  - ✓ Inclusion of fly ash in the guidelines/specifications of road/construction projects

  - ✓ Filling up of low-lying areas with pond ash

  - ✓ A High Level Committee has been constituted with representatives from concerned Ministries, Technical Institutions and All India Brick and Tile Manufacturers Federation to review the implementation of the provisions of fly ash notification dated September 14, 1999. Besides monitoring the implementation of the provisions of the Notification, the Committee will also provide policy guidance on utilisation of fly ash in various sectors / developmental activities including incentives/disincentives required thereof.

5.3.4.2 Central Pollution Control Board (CPCB)

The Central Board for the Prevention and Control of Pollution, a statutory organisation, was constituted in September, 1974 under the Water (Prevention and Control of Pollution) Act, 1974. Further, CPCB was entrusted with the powers and functions under the Air (Prevention and Control of Pollution) Act, 1981. The name was later changed to Central Pollution Control Board (CPCB).

It serves as a field formation and also provides technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986. Principal functions of the CPCB, as spelt out in the

Water (Prevention and Control of Pollution) Act, 1974, and the Air (Prevention and Control of Pollution) Act, 1981, (i) to promote cleanliness of streams and wells in different areas of the States by prevention, control and abatement of water pollution, and (ii) to improve the quality of air and to prevent, control or abate air pollution in the country.

Air Quality Monitoring is an important part of the air quality management. The National Ambient Air Quality Monitoring (NAAQM) Programme has been established with objectives to determine the present air quality status and trends and to control and regulate pollution from industries and other source to meet the air quality standards. It also provides background air quality data needed for industrial sitting and towns planning.

Besides this, CPCB has an automatic monitoring station at ITO Intersection in New Delhi. At this station Respirable Suspended Particulate Matter (RSPM), Carbon Monoxide (CO), Ozone (O_3), Sulphur Dioxide (SO_2), Nitrogen Dioxide (NO_2) and Suspended Particulate Matter (SPM) are being monitored regularly. This information on Air Quality at ITO is updated every week.

Fresh water is a finite resource essential for use in agriculture, industry, propagation of wildlife & fisheries and for human existence. India is a riverine country. It has 14 major rivers, 44 medium rivers and 55 minor rivers besides numerous lakes, ponds and wells which are used as primary source of drinking water even without treatment. Most of the rivers, being fed by monsoon rains, which are limited to only three months of the year, run dry throughout the rest of the year often carrying wastewater discharges from industries or cities/towns endangering the quality of our scarce water resources. The Parliament of India in its wisdom enacted the Water (Prevention and Control of Pollution) Act, 1974 with a view to maintaining and restoring wholesomeness of our water bodies. One of the mandates of CPCB is to collect, collate and disseminate technical and statistical data relating to water pollution. Hence, Water Quality Monitoring (WQM) and Surveillance are of utmost importance.

Functions of CPCB

- Advise the Central Government on any matter concerning prevention and control of water and air pollution and improvement of the quality of air.

- Plan and cause to be executed a nation-wide program for the prevention, control or abatement of water and air pollution;

- Co-ordinate the activities of the State Board and resolve disputes among them;

- Provide technical assistance and guidance to the State Boards, carry out and sponsor investigation and research relating to problems of water and air pollution, and for their prevention, control or abatement;

- ❖ Plan and organise training of persons engaged in programme on the prevention, control or abatement of water and air pollution;

- ❖ Organise through mass media, a comprehensive mass awareness programme on the prevention, control or abatement of water and air pollution;

- ❖ Collect, compile and publish technical and statistical data relating to water and air pollution and the measures devised for their effective prevention, control or abatement;

- ❖ Prepare manuals, codes and guidelines relating to treatment and disposal of sewage and trade effluents as well as for stack gas cleaning devices, stacks and ducts;

- ❖ Disseminate information in respect of matters relating to water and air pollution and their prevention and control;

- ❖ Lay down, modify or annul, in consultation with the State Governments concerned, the standards for stream or well, and lay down standards for the quality of air; and

- ❖ Perform such other function as may be prescribed by the Government of India.

5.3.5 Ministry of Finance

5.3.5.1 Central Board of Excise and Customs

Central Board of Excise and Customs (CBEC) is a part of the Department of Revenue under the Ministry of Finance, Government of India. It deals with the tasks of formulation of policy concerning levy and collection of Customs and Central Excise duties, prevention of smuggling and administration of matters relating to Customs, Central Excise and Narcotics to the extent under CBEC's purview. The Board is the administrative authority for its subordinate organisations, including Custom Houses, Central Excise Commissionerates and the Central Revenues Control Laboratory.

5.3.6 Ministry of Labour

Main Thrust Areas for Ministry of Labour are:

- Labour Policy and legislation;
- Safety, health and welfare of labour;
- Social security of labour;
- Policy relating to special target groups such as women and child labour;
- Industrial relations and enforcement of labour laws in the Central sphere;

- Adjudication of industrial disputes through Central Government Industrial Tribunals cum Labour Courts and National Industrial Tribunals;
- Workers' Education;
- Labour and Employment Statistics;
- Emigration of Labour for employment abroad;
- Employment services and vocational training;
- Administration of Central Labour & Employment Services; and
- International co-operation in labour and employment matters;

The ILO (International labour Organisation) conventions adopted my member nations (including India). List of International Labour Organisation Conventions Ratified by India are listed in **Table 61**.

Table 61: List of International Labour Organisation Conventions

Sl. No.	No. and Title of Convention	Date of Ratification
1.	No.1 Hours of Work (Industry) Convention, 1919	14.07.1921
2.*	No.2 Unemployment Convention, 1919	14.07.1921
3.	No.4 Night Work (Women) Convention, 1919	14.07.1921
4.	No.5 Minimum Age (Industry) Convention, 1919	09.09.1955
5.	No.6 Night Work of Young Persons (Industry) Convention, 1919	14.07.1921
6.	No.11 Right of Association (Agriculture) Convention, 1921	11.05.1923
7.	No.14 Weekly Rest (Industry) Convention, 1921	11.05.1923
8.	No.15 Minimum Age (Trimmers and Stokers) Convention, 1921	20.11.1922
9.	No.16 Medical Examination of Young Persons (Sea) Convention, 1921	20.11.1922
10.	No.18 Workmen’s Compensation (Occupational Diseases) Convention, 1925	30.09.1927
11.	No.19 Equality of Treatment (Accident Compensation) Convention, 1925	30.09.1927
12.	No.21 Inspection of Emigrants Convention, 1926	14.01.1928
13.	No.22 Seamen’s Articles of Agreement Convention, 1926	31.10.1932
14.	No.26 Minimum Wage-Fixing Machinery, Convention, 1928	10.01.1955
15.	No.27 Marking of Weight (Packages Transported by Vessels) Convention, 1929	07.09.1931
16.	No.29 Forced Labour Convention, 1930	30.11.1954
17.	No.32 Protection Against Accidents (Dockers) Convention (Revised), 1932	10.02.1947
18.@	No.41 Night Work (Women) Convention (Revised), 1934	22.11.1935
19.	No.42 Workmen’s Compensation (Occupational Diseases) Convention (Revised), 1934	13.01.1964

Sl. No.	No. and Title of Convention	Date of Ratification
20	No.45 Underground Work (Women) Convention, 1935	25.03.1938
21.	No.80 Final Articles Revision Convention, 1946	17.11.1947
22. **	No.81 Labour Inspection Convention, 1947	07.04.1949
23.	No.88 Employment Services Convention, 1948	24.06.1959
24.	No.89 Night Work (Women) Convention (Revised), 1948	27.02.1950
25.	No.90 Night Work of Young Persons (Industry) (Revised), 1948	27.02.1950
26.	No.100 Equal Remuneration Convention, 1951	25.09.1958
27.	No.107 Indigenous and Tribal Population Convention, 1957	29.09.1958
28.	No.111 Discrimination (Employment & Occupation) Convention, 1958	03.06.1960
29.	No.116 Final Articles Revision Convention, 1961	21.06.1962
30.#	No.118 Equality of Treatment (Social Security) Convention, 1962	19.08.1964
31.@@	No.123 Minimum Age (Underground Work) Convention, 1965	20.03.1975
32.	No.115 Radiation Protection Convention, 1960	17.11.1975
33.	No.141 Rural Workers' Organisation Convention, 1975	18.08.1977
34.	No.144 Tripartite Consultation (International Labour Standards) Convention, 1976	27.02.1978
35.	No.136 Benzene Convention, 1971	11.06.1991
36.##	No.160 Labour Statistics Convention, 1985	01.04.1992
37.	No.147 Merchant Shipping (Minimum Standards), 1976	26.09.1996
38.	No.122 Employment Policy Convention 1964	17.11.1998
39.	No.105 Abolition of Forced Labour, 1957	18.05.2000

***** Later denounced, The Convention requires, internal furnishing of statistics concerning unemployment every three months which is considered not practicable.

@ Convention denounced as a result of ratification of Convention No.89.

****** Excluding Part II.

Branches (c) and (g) and Branches (a) to (c) and (i).

@@ Minimum Age initially specified was 16 yrs. but was raised to 18 years in 1989.

Article 8 of Part – II.

5.3.6.1 Directorate General, Factory Advice Service and Labour Institutes

The office of the Chief Adviser of factories, which is now called Directorate General, Factory Advice Service and Labour Institutes, was set up in 1945 with the objective of advising Central And State Governments on

administration of the Factories Act and coordinating the factory inspection services in the States.

The DGFASLI is an attached office of the Ministry of Labour, Government of India and serves as a technical arm to assist the Ministry in formulating national policies on occupational safety and health in factories and docks. It also advises factories on various problems concerning safety, health, efficiency and well - being of the persons at work places.

DGFASLI with headquarters at Mumbai maintains overall liaison with the labour institutes, frames policy, plans and executes the program concerning the organisation on matters pertaining to safety, health and welfare of workers in industries and docks and implements technical projects and liaises with national and international agencies.

The headquarters consists of the following divisions:

- Factory Advice Service;
- Docks Safety;
- Construction Safety;
- Awards; and
- MIS Division

Factory Advice Service

The Factory Advice Service division coordinates the administration of the Factories Act in the States and advises the Central and State Governments on related matters. The activities include interpretation of the provisions of the Act and the Rules, formulation of Model Rules, recommending amendments to the provisions of the Factories Act, and the Rules whenever necessary, issue of technical guidelines, organising and conducting training for Inspectors of Factories, recommending approval of flameproof equipment for use in the factories, review and comment on documents on safety and health from the International Labour Organisation and other international agencies and participation in international programmes.

A conference of the Chief Inspectors of Factories of the States is convened annually for the purpose of obtaining their views and suggestions regarding the changes that need to be made in the Act and Rules to meet the changing conditions brought about by new technology.

The division has also been organising training for Fellows from developing countries under various technical assistance programmes of the government such as COLOMBO Plan, Special Common Wealth African Assistance Programme (SCAAP), etc. which are generally of three months duration. During the last 8 years (1981-88) 41 fellows have been trained.

The statistical cell under the Division collects and compiles accident statistics and other information related to the administration of the Factories Act and Rules framed there under. This information base is used in planning and

implementation of national policies concerning occupational safety and health. This information is also used to prepare replies to the various Parliament questions.

5.3.7 Ministry of Petroleum & Natural Gas

The Ministry of Petroleum & Natural Gas is entrusted with the responsibility of exploration and production of oil and natural gas, their refining, distribution and marketing, import, export, and conservation of petroleum products and Liquefied Natural Gas.

Important areas of work allocated to the Ministry of Petroleum & Natural Gas are:

- Exploration and exploitation of petroleum resources, including natural gas;
- Production, supply distribution, marketing and pricing of petroleum including natural gas and petroleum products;
- Oil refineries, including Lube plants;
- Additives for petroleum and petroleum products; and
- Lube blending and greases.
- Planning, development and control of, and assistance to all industries dealt with by the Ministry;
- All attached or subordinate offices or other organisations concerned with any of the subject specified in this list;
- Planning, development and regulation of oilfield services;
- Public sector projects falling under the subjects included in this list;
- Engineers India limited and IBP Company. together with its subsidiaries, except such projects as are specifically allotted to any other Ministry/Dept; and
- Administration of various Acts and Rules

5.3.8 Ministry of Shipping, Road Transport and Highways

The then Department of War Transport was formed in July, 1942 by the bifurcation of the then Department of Communications into two Departments viz., (i) the Department of Posts and (ii) the Department of War Transport. At the time, the functions allocated to the Department of War Transport included major ports, railway priorities, utilisation of road & water transport, petrol rationing & producer gas, coastal shipping and the administration and development of major ports. The Ministry of Road Transport & Highways and Ministry of Shipping were merged on 2nd September, 2004 into a single Ministry of Shipping, Road Transport & Highways, with two Departments, namely the Department of Shipping and the Department of Road Transport & Highways. The Department of Shipping deals with shipping and marine transportation issues, not relevant to this Chemical profile. The Department of Road Transport and Highways is described next.

5.3.8.1 Department of Road Transport & Highways

This Department is responsible for development and maintenance of National Highways, administration of the Central Road Fund and formulation and implementation of policies relating to road transport, as follows:-

- Compulsory insurance of motor vehicles.
- Administration of the Road Transport Corporations Act, 1950 (64 of 1950).
- Highways declared by or under law made by Parliament to be national highways.
- Roads other than National Highways for Union Territories.
- Administration of the Motor Vehicles Act, 1988 (59 of 1988) and taxation of motor vehicles for Union Territories
- Vehicles other than mechanically propelled vehicles for Union Territories.
- Central Road Fund
- Coordination and Research pertaining to Road Works.
- Road works financed in whole or in part by the Central Govt. other than those in the North-Eastern Region.
- Motor vehicles legislation.
- Promotion of Transport Cooperatives in the field of motor transport.
- Formulation of the privatisation policy in the infrastructure areas of roads.
- National Highways Authority of India.
- National Institute for Training of Highway Engineers.
- Indian Road Construction Corporation
- The Road Transport Corporations Act, 1950 (64 of 1950).
- The National Highway Act, 1956 (48 of 1956).
- The Motor Vehicles Act, 1988 (59 of 1988) and the Rules framed there under, namely the Central Motor Vehicles Rules (CMVR), where there are specific Rules dealing with Hazardous goods transportation dealing with rules for Consigner, Consignee, Transporters etc. These are the most important Hazardous goods road transportation rules.
- The National Highways Authority of India Act, 1988 (68 of 1988).

5.4 Comments / Analysis

- There are no such overlapping mandates amongst various ministries and bodies. If there lies any confusion, this can be sorted out through inter-ministerial committees and various other meetings etc.

- The Environment (Protection) Act 1986 is an umbrella Act for fulfilling the general mandate set out in legal instruments. In addition, other ministries have also enacted relevant legal instruments to have overall coverage of the entire area of chemical management. There is no such situation where it is not clear about the general mandate set out in the legal instruments.

- Mandate of various ministries and institutions are clearly laid down in legal instrument and entire area of chemical management is being adequately covered, as can be seen from this and previous chapter. Therefore, at present, no new ministries' or other institutions' involvement for chemical management is required.

- It has already been described in Chapter 4, under effectiveness of implementation of the laws that the limitations are mostly with the lack of manpower with each regulatory body which can be sorted out by employing private consultants / auditors through accreditation mechanisms.

CHAPTER 6

RELEVANT ACTIVITIES OF INDUSTRY, PUBLIC INTEREST GROUPS AND THE RESEARCH SECTOR

6.1 Description of Organisations / Programmes

India has developed a strong knowledge and expertise base outside the government set up in the field of chemicals management (covering chemicals import, production, transportation, use and disposal). The non-government sector organisations involved either directly or indirectly in chemicals management are far too numerous to elaborate in this document. Only the major ones are described. The major bodies include Industry Associations, Universities & Educational Institutions, Community based organisations, Trade Unions and Professional organisations. A brief on the major organisations is given below and summarised in **Table 62.**

6.1.1 Industry Associations

Industry Associations include National level bodies, Local bodies (area-wise) and Sectoral Organisations (representing an industrial "sector").

(a). National Level Organisations

India has various national level industrial organisations catering to the needs of industries. The four organisations listed below have a wide, large and active membership base:

- Indian Chemical Council ((ICC) - formerly the Indian Chemical Manufacturers Association (ICMA))
- Confederation of Indian Industry (CII)
- Federation of Indian Chambers of Commerce and Industry (FICCI) and
- Associated Chambers of Commerce (ASSOCHAM)

These associations play an important role in fiscal and other government policy approaches, legal aspects, environmental aspects, safety aspects, trade (GATT, WTO, Patent regime etc.) issues and related issues in the field of chemicals. They act as a vital link between the Government of India and their members. They also play an important role in the field of training and development, awareness building and generally building knowledge base and good will amongst members of the public. Of late, the issue of Corporate Governance has assumed focus. They sponsor or co-sponsor a host of initiatives in the field of chemicals management. They also drive the movements for initiatives such as ISO 9000, ISO 14000, OHSAS 18001, Responsible Care (ICC mainly), product stewardship, eco-labelling and others and help in the implementation and training on other national issues being undertaken by the Government. They also serve an important role in

informing members on issues of government fiscal and trade policies, environmental issues and many other aspects of the business.

They play an active role in raising awareness and good will amongst workers but only a limited role in raising awareness with members of the public at large. They have limited expertise in the field of chemicals testing, not having developed the expertise independently (as it is often available with member industries or other organisations).

(b). Local Level Organisations

This group includes local level industrial organisations representing Industry within *specific industrialised pockets* of the country or industrial clusters, some examples include the Vapi Industries Association in Vapi, Gujarat, the Ankleshwar Industries Association in Ankleshwar and many others. These local level organisations bring together local industry into a single forum and take up common issues of interest. Many are autonomous and fund themselves through their members and some obtain grants for larger initiatives. They also organise or co-organise many workshops, seminars, training programs on chemicals and serve an important role in initiatives such as ISO 9000, ISO 14000, OHSAS 18001, product stewardship and others. They also play an important role in raising awareness and good will amongst workers and the public and are very active in organising seminars and workshops on important issues, members of the public are encouraged to participate.

(c). Sectoral Organisations

This group includes organisations representing *groups of manufacturers of a specific subset / group of chemicals,* active and well known organisations in this group include the Bulk Drug Manufacturers Association (BDMA), the Crop Care Association, the Dyes Manufacturers of India (DMAI), the Gujarat Dyestuffs Manufacturers' Association (GDMA), Indian Alkali Manufacturers' Association (IAMA), the Speciality Chemicals Manufacturers' Association of India, the Fertiliser Association of India (FAI) and others covering different chemical sectors. Similar to the national and local level bodies, they also play an important role in raising member awareness and importantly good will amongst the public and active in organising seminars and workshops on a host of issues.

6.1.2 Universities, Research and educational institutions

Universities, research organisations and other educational institutes and places of higher learning are spread all over the country. Some of them have played an important role in testing of chemicals, environmental monitoring, research on alternatives and have also supported the Government in training initiatives through various methods including hiring out of faculty, lecture halls and in general making available their vast academic expertise to society at large. The universities considered of particular importance are listed in *Chapter 9.*

Over the last decade, primary schools have initiated education and awareness drives covering the environment and chemical pollution in particular. These issues are assuming greater emphasis in school curricula.

Research and Development are initiatives being actively supported by the Ministry of Environment and Forests, Environmental Education Division, the Ministry of Science and Technology and other Departments. There are several programs aimed at promoting energy conservation, cleaner technologies, reduced pollution, better conversion efficiency and breakthrough technology in the field of chemicals. Details of spending and budget of different ministries is given in *Chapter12.*

Universities and Research organisations have developed good expertise in the more academic areas of chemicals testing and research alternatives, but are not active in the field of raising awareness amongst workers, public, enforcement and risk assessment.

6.1.3 Community based Groups

These include community based groups that aim to represent the general public at large. India has a very considerable active Non Governmental Organisation (NGO) community. They serve to bring notice to the public and judiciary of the country issues of public, local and national importance. They have also effectively put pressure on the Government to take firm action in areas needing attention, highlighted malpractices by industry and brought critical information to the public domain. The Government has always supported the free working of such NGOs and has an open and mature relationship with them. Some of the NGOs prominent in the field of chemicals management include Centre for Science and Environment, Development Alternatives, Toxic Links, Greenpeace, Thanaan and Paryavaran Suraksha Samiti (Gujarat). Some of the organisations have developed limited capability for monitoring and testing.

A brief on them is given in Table 61 including the areas they are active in.

6.1.4 Trade Unions and Labour Organisations

Indian Industry has a large organised trade union base and there are often several active unions within a large company. The major trades unions active include the Centre of Indian Trade Unions (CITU), All India Trade Union Congress (AITUC), the Indian National Trade Union Congress (INTUC) and Hindustan Mazdoor Sangh (HMS), owing allegiance to a particular political party.

Table 61provides a brief on the major organisations involved in the field of chemicals management outside the Government including information on contact points and a brief statement describing activities and areas of interest.

The Unions are active in the field of dissemination of information to the Workers (and the public), some policy analysis (where it affects workers

primarily) but have not specifically developed expertise covering testing, sampling, research etc.

6.1.5 Professional Organisations

Professional organisations play an important role in supporting programmes initiated by the Government. There are numerous Consulting organisations providing support in the field of import, production (design, construction, optimisation etc.), waste disposal and other aspects. Several bodies have built up capability for monitoring and chemical testing. Professional organisations render several services to the industry for the purpose of meeting Government requirements (e.g. environment monitoring, risk assessment, EIA etc.). Many private Consulting organisations also render consultancy services to the Government of India ministries such as the Ministry of Environment and Forests in the areas of hazardous chemicals management. The Government partially has in place a firm mechanism for accrediting Consulting agencies (e.g. enlistment of "Competent Third Parties" for inspection of pressure vessels under the Factories Act, Petroleum Act and Explosives Act etc.). Even where agencies are enlisted, the mechanism for standardisation of inspection procedures etc. needs attention.

6.2 Summary of Expertise Available Outside of Government

Table 63 provides, in summary form, an overview of the nature of expertise in non government organisations which might be available top support national programmes and policies related to chemicals management.

6.3 Comments/ Analysis

- The Indian Constitution provides for the "right of information" to all citizens- as a result, the Non Government organisations have free access to printed documents, websites and other communication channels including Official meetings, conferences, workshops etc. NGOs are also encouraged to actively participate in various committees, in development of standards and other related issues.

- Voluntary initiatives achieved by the Industry Associations include certification to ISO standards 9000, 14000 and OHSAS 18001. Responsible Care programs too have achieved encouraging response.

- NGOs have flourished and grown considerably over the last two decades- they now are well integrated and conduct awareness and training workshops often supported by the Government for dissemination of information to the public about government activities in the field of chemicals management.

- NGOs have full rights to approach the district and higher-level courts including consumer courts for prosecution of industries, Pollution Control Boards, other Government agencies through mechanisms available in India such as the Public Interest Litigation (PIL).

- No relevant / specific studies have been carried out by NGOs for strengthening government capacity for chemicals management.

- In summary, there is a very cordial and participative relationship between the Government and the NGOs in the field of chemicals management.

- It is recognised by the Government that the non government sector will play a larger role in the time to come. One issue that requires attention is the need to accredit Consulting agencies and standardise specific support mechanisms such as Inspections. Once the government brings into place a mechanism to accredit non-government agencies and standardise their support roles, the sector could play an enhanced role in the development of the country. Presently, the sector is highly scattered and not effectively organised.

- Capability does exist in aggregate in the areas of data collection, testing, risk assessment, risk reduction, policy analysis, research on alternatives, training and education, monitoring, enforcement and raising awareness of workers and public), though not all exist with each type of body. The cross sourcing of expertise must be encouraged or structured for greater effect.

Table 62: Important Organisations Involved with Chemicals Management

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
Industry and Trade (Industrial)																		
CII (Confederation of Indian Industry)	CII Headquarters, Mantosh Sondhi Centre, 23 Institutional Area, Lodi Road, New Delhi - 110 003 Phone : 24629994, Fax : 24621649, 24633168 E-mail : ciico@ciionline.org	Apex National level body for Industry. Wide membership across all sectors of industry. Active environment cell. Close liaison with related Ministries on trade, POPs, PIC decisions, Basel issues etc. Represents industry view on Impact Assessment Committees and other bodies. Worldwide offices. Has been active in promoting Cleaner Production Technologies. Was active in ISO 9000, 14000 and OHSAS 18001.	√			√	√	√	√				√		√	√	√	√
Indian Chemical Council (ICC- formerly the ICMA or Indian Chemicals Manufactures' Association)	Sir Vithaldas Chambers , 16 Mumbai Samachar Marg, MUMBAI – 400 023, Tel: 91-22-22047649, 22048043, 22846852, Fax: 91-22-22048057, Email: iccwro@iccindia.com	Apex National level body for Chemical Manufacturers. Wide membership across all sectors of industry. Active environment and Safety cell. Close liaison with related Ministries on trade, POPs, PIC decisions, Basel issues etc. Represents chemical industry view on various Government Committees. At the forefront of Responsible Care and also promotes ISO 9000, ISO 14000 and OHSAS 18001 and also EMAS.60% membership from Gujarat.	√		√	√	√	√	√				√		√	√	√	√

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
FICCI (Federation of Indian Chambers Commerce and Industries)	Federation House, Tansen Marg, New Delhi 110 001 Phone : 011 - 23738760 - 70, Fax : 23721504, 23720714, E-mail : ficci@ficci.com	Mainly a trade body- connected more with treaties (UN, GATT, WTO etc.), country to country programs (over 69 Joint Business Councils formed). Over 1500 corporates and 500 trade and industry associations affiliated members. Was active in ISO 9000 and ISO 1400 initiatives and facilitation/ accreditation programs for the same. Possesses a state of the art food testing laboratory.	√			√	√	√	√				√		√	√	√	√
ASSOCHAM (Associated Chambers of Commerce)	Corporate House, 147 B Gautam Nagar, Gulmohar Enclave, New Delhi-110 049, Tel: 91-11-26512477-79, 91-11-51643407-10, Fax: 91-11-26512154, E-mail: assocham@nic.in	Mainly a trade body- connected with treaties (UN, GATT, WTO etc.), many trade and industry associations affiliated.	√				√	√	√				√		√	√	√	√
Sector Specific (Industrial)																		
FAI- Fertiliser Association of India	10, Shaheed Jit Singh Marg, New Delhi 110 067, India, Tel: 91-11-6517305/ 6517183/ 6517313/ 6567144/ 6857229/ 6863192, Fax: 91-11-6960052, *E-mail : fai@vsnl.com*	Important body comprising manufacturers, importers, distributors of over 50000 TPA (Active members), marketing federations, apex bodies, bio fertiliser manufacturers, seed companies etc. (Associate members), equipment suppliers, consultants (technical, marketing etc.) working in fertiliser field and others (Technical and Professional members). About 1900 members. Very closely	√			√	√	√	√				√		√	√	√	√

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
		associated with Ministry of Chemicals and Fertilisers on policy issues, subsidies, efficiency issues, quotas etc.																
BDMA- Bulk Drugs Manufacturers' Association	C-25, Industrial Estate, Near SBH, Sanathnagar, Hyderabad – 500 038. A.P. INDIA, Ph : 91 -40 - 23703910 / 23706718, Telefax :91-40 -23704804, E-mail - info@bdm-assn.org | hyd2_bdmahyd@sancharnet.in	Based in the bulk drug capital of Hyderabad. A one stop shop for all issues concerning bulk drugs business growth (trade, environmental, safety, technology transfer, taxes, incentives etc.). Testing and associated facilities being established.	√			√	√	√					√		√	√	√	√
DMAI- Dyestuff Manufacturers' Association of India)	46/47, 4th Floor, 296, Samuel Street, Vadgadi, Mumbai - 400 003 Tel. : +(91) 22 23420752 Fax : +(91) 22 23411036, E-mail : dmai@vsnl.com	Established in 1950, over 1000 manufacturers represented. Active in promoting dyes, technology up gradation and all issues concerning dyes policies, trade, environmental and related issues. There are over 950 units making dyes and dye intermediates spread over the large, medium and small scale sector. These products are used in textile, leather, paints, Inks etc. and India is one of major exporters of Dyes to the tune of 2000 Crores INR.	√			√	√	√					√		√	√	√	√
Pesticides Association of India	520-521,Ansal Chambers II, 6, Bhikaji Cama Place, New Delhi-110066. E Mail: pai520bcp@vsnl.net	Represents major pesticide manufacturers. Active in trade, technology issues and dealing with the Government of India on banned pesticides, phases out and related issues.	√			√	√	√					√		√	√	√	√

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
Alkali Manufacturers' Association of India	3rd Floor, Pankaj Chambers, Preet Vihar Commercial Complex, Vikas Marg, Delhi-110092. Tel: 022-26663462 E mail: amaionline.org,	Represents major caustic soda and chlorine manufacturers. Active in trade, technology issues (mercury cell, diaphragm cells issues), pollution control common issues and concerns, trade and tariff issues with the Government of India. Strong links to world alkali production and technology companies.	√			√	√	√					√		√	√	√	√
Indian Crop Protection Association	102, Creative Industrial Building, Sundernagar, Road No. 2, Kalina, Santacruz (E), Mumbai-400098	An organisation representing manufacturers of pesticides, weedicides, fungicides etc. Active in issues concerned with quality etc.	√			√	√	√					√		√	√	√	√
Pesticide Manufacturers' Formulators Association of India	B-4, Anand Co-op. Housing society Sitladevi Temple Road, Mahim (West), Mumbai-400021. Tel: 022-26116845 E mail: pmfai@bom4vsnl.net.in, website: pmfai.org	An organisation representing pesticide formulation units (dust, liquid, granules etc.). Active in quality issues, links with farmer groups and issues connected with formulation of banned and restricted technical grade pesticides.	√			√	√	√					√		√	√	√	√
Chemexcil	Centre-I. 12th Floor, World Trade Centre, Cuffe Parade, Mumbai-400005. E mail: chem@giasmo.i.vsnl.in, Website:www.chemexil.org	Association of chemical exporters mainly concerned with trade and tariff issues, fighting cheap imports from other countries, customs tariff issues and also other areas of common interest of members.	√			√	√	√					√		√	√	√	√

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
Indian Speciality Chemicals Manufacturers' Association	1156, Bole Smruti, Suryavanshi K S Marg, Off: Veer Sarvarkar Marg, Dadar, Mumbai-400021	Represents major speciality chemicals manufacturers. Active in trade, technology, tariff issues, exports and other common issues. Active in organisation of trade fairs and participation of Indian manufacturers in world fairs across the world. Established in 1952. Most of the members are manufacturers of chemicals required for ONGC, Oil drilling, refineries, National Textiles Corporation and others.	√			√	√	√					√		√	√	√	√
Gujarat Dyestuff Manufacturers' Association of India	A-501/503, Doctor House, Near Parimal Rly Crossing, Ellis Bridge, Ahmedabad - 380006. Website: www.gdma.org	As the major manufacturers of dyes are based in Gujarat, this Association is highly active in promotion of trade, taking up of technology issues, environment concerns (limiting standards for emission etc.). Plays an important role in convincing members to improve technology, minimise waste, reduce pollution, issues related to common effluent treatment plants and many others of common interest. Also takes up issues of trade and commerce, exports etc.	√			√	√	√					√		√	√	√	√
Research Institutes, Universities - SEE CHAPTER-9																		

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
Environmental/ Consumer Groups																		
Centre for Science and Environment	41, Tughlakabad Institutional Area, New Delhi. India – 110062, Tel: +91-11 29955124; 29956110; 29956394, Fax: +91-11 29955879, E-mail: cse@cseindia.org	CSE is a large non-governmental organisation actively involved in issues relating to air pollution, global green governance, rainwater harvesting, environmental education, investigation of the presence of toxic elements in food items and consumer products, etc,. It has a full fledged lab for testing and environmental monitoring also.	√	√	√	√	√	√		√			√					√
Development Alternatives	111/9-Z, Kishangarh, Vasant Kunj, New Delhi – 110070, Tel : 91 (11) 2613-4103, 2689-0380, Fax : 91 (11) 2613-0817, Email : tara@devalt.org	Established in 1983, Development Alternatives works with partners in all sectors: government, international agencies, public and private sector institutions and grass root voluntary organisations. The respective functional units of the Development Alternatives Group provide support to partners. The group has its own water and air monitoring instruments manufacturing facility and regularly monitors environmental parameters under its various schemes such as Clean India, Delhi Environment Action Network, etc.	√	√			√	√		√			√					√

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
Toxic Links	H2 (Ground Floor), Jangpura Extension, New Delhi 110 014, T: +91-(0)11-24328006, 24320711, F: +91-(0)11-24321747, E: info@toxicslink.org	Toxics link is India's leading NGO working in toxics and waste issues. It emerged from a need to establish a mechanism for disseminating credible information about toxics in India, and for raising the level of the debate on these issues. The goal was to develop an information exchange and support organisation that would use research and advocacy in strengthening campaigns against toxic pollution, help push industries towards cleaner production, and link groups working on toxics and waste issues. Over time, it has developed capacities to interact with the grassroots through outreach amongst various civil society actors, as well as to play a role in influencing policy and have conversations with other stakeholders such as industry and technical experts. It is also central to networks connecting experts, civil society groups and individuals working nationally and internationally on issues related to toxics.	√	√	√	√	√	√		√			√						√

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
Greenpeace	#3360, 13th B Main, HAL II Stage, Indira Nagar, Bangalore, Karnataka, India, Tel: +91 80 51154866, Fax: +91 80 51154862	Greenpeace is a non-profit organisation having main office for India in Bangalore and also in other 9 cities across the country. To maintain its independence, Greenpeace relies on contributions from individual supporters and foundation grants only. As a global organisation with presence in 40 countries, Greenpeace focuses on the most critical worldwide environmental issues such as:· Oceans and ancient forests protection;· Fossil fuel phase out and the promotion of renewable energies;· Nuclear disarmament and an end nuclear contamination;· Elimination of toxic chemicals; and· Preventing the release of genetically engineered organisms.	√	√	√	√	√	√	√	√			√						√
Thannan, Thiruvananthpuram	thanal@nd4.vsnl.net.in	Thanaan is a local level NGO of Kerala active in chemical safety.	√	√	√	√	√	√		√			√						√
Pariyavaran Suraksha Samiti Gujarat	MICHAEL MADGAONKAR, pss@narmada.net.in	Paryavaran Suraksha Samiti, founded in 2001 is a local NGO working on environmental pollution in Gujarat.	√	√	√	√	√	√		√			√						√

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
Labour Unions																		
CITU (Centre of Indian Trade Unions)	M.K. Pandhe, President, CITU, Central Office, B T Ranadive Bhawan, 13-A Rouse Avenue, New Delhi - 100 001, Tel:011-2322 1288,2322 1306, Fax: 011-2322 1284, E-mail:citu@bol.net.in	The Centre of Indian Trade Unions is one of biggest assembly of workers and toiling classes of India. With a membership of millions spread out in the organised sectors of rail, postal, telecom, banking, insurance sectors and unorganised sectors like construction workers, bidi workers, day-wagers, CITU is the unifying force of the working classes. The organisation's focus is on the health and welfare issues of the workers.					√	√			√	√	√					√
INTUC (Indian National Trade Union Congress)	"Shramik Kendra" 4, Bhai Veer Singh Marg, New Delhi 110 001. India, Tel: 91-11-3747767, 91-11-3747768. Fax: 91-11-3364244., intuchq@del3.vsnl.net.in	Established in May 1947, INTUC has been championing the cause of the Indian working class with a responsible and constructive approach and has been consistently endeavouring to better their working and living conditions. The INTUC has played a very vital role in almost all legislations enacted in the interest of the workers and has been successful in bringing about a progressive re-orientation in the policies and programmes of the governments, both at the Centre and in the States.					√	√			√	√	√					√

Organisations	Address and Contact Details	Brief Background	Data Collection	Testing of Chemicals	Risk Assessment	Risk Reduction	Policy Analysis	Training & Education	Research on Alternatives	Monitoring	Enforcement	Information to Workers	Information to Public	Others	Promote Business Interests	Responsible Care	ISO Series (9000, 14000 ETC.) and OHSAS 18000	Seminars/ Workshops/ Meets/ Newsletters/ Pamphlets etc.
BMS (Bharat Mazdoor Sangh)		Founded in July 1955, BMS is one of the leading trade unions having membership in excess of 65 lakh all over the country and actively involved in taking up the issues of workers health and welfare. It actively participates in policy related to industry, labour and economics affecting the workers. Bharatiya Shram Shodh Mandal, formed by BMS, is a research based institution working to promote objective studies based on impartial examination of facts and development in the industrial field					√	√			√	√	√					√
AITUC (All India Trade Union Congress)		The All India Trade Union Congress, the oldest trade union of India, was established in 1920. It is affiliated to the Congress Party and works towards the cause of labour welfare and health issues of workers.					√	√			√	√	√					√
Professional Organisations																		
Consulting Organisations Spread all over India – Numerous		Spread all over the country and cover the entire range of expertise. No single registered accreditation body.	√	√	√	√	√	√									√	√

Table 63: Summary of Expertise Available

Field Of Expertise	Research Institutes	Universities	Industry/ Industry Associations	Environmental/ Consumer Groups	Labour Unions	Professional Organisations
Data Collection	√√	√√	√√	√	--	√√
Testing of Chemicals	√√√	√√	√	√	--	√√
Risk Assessment	√	√	√√		--	√√
Risk Reduction	√	√	√√	√	--	√√
Policy Analysis	√	√	√√	√√	√√	
Training and Education	√√	√√	√	√	√	√
Research on Alternatives	√√	√√	√√	--	--	√
Monitoring	√√√	√	√√	√√	√	√
Enforcement	√	--	√√	√	√√	
Information to Workers	--	--	√√	√	√√√	√
Information to Public	--	--	√	√√	√	--
Others	--	--	--	--	--	--

Key:

√ Limited expertise available
√√ Expertise available
√√√ Ample expertise available
-- Not Relevant

CHAPTER 7

INTER-MINISTERIAL COMMISSIONS AND COORDINATING MECHANISMS

7.1 Introduction

As can be seen from earlier chapters, roles and responsibilities of various ministries and government bodies are well defined, however, there are issues, which requires inputs from more than one ministries or government bodies under different ministries. For this purpose, there exist various inter-ministerial commissions or committees. Some of the important inter-ministerial committees, which deal with the management of chemicals, are briefly discussed at **Table 64**

7.2 Description of Inter-ministerial Commissions and Coordinating Mechanisms

7.2.1 Consultative Group

Ministry of Environment & Forests, Government of India, has constituted a Consultative Group on Chemicals to deliberate and finalise India's position on matters pertaining to:

a) Basel Convention on the control of Trans-boundary Movement of Hazardous Wastes and their disposal.

b) The Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for certain Hazardous Chemicals and Pesticides in International Trade

c) The Stockholm Convention on Persistent Organic Pollutants (POPs).

Functions of the Consultative Group:

Functions of the Consultative Group are to discuss issues relating to Basel Convention, Rotterdam Convention, Stockholm Convention and to help prepare national negotiations.

7.2.2 Central Crisis Group

As per the requirement under Rule 3 of the Chemical Accident (Emergency Planning Preparedness and Response) Rules, 1996, The MoEF has constituted a Central Crisis Group (CCG) under the Chairmanship of the secretary (E&F) with members from concerned ministries, governmental bodies and industry representatives. The Central Crisis Group is the apex body to deal with major chemical accidents and to provide expert guidance for handling, prevention and recurrence of major chemical accidents. The Group is required to meet every six months.

Functions of the Central Crisis Group

The Central Crisis Group is the apex body to deal with major chemical accidents and to provide expert guidance for handling major chemical accidents. Functions of the CCG are:

- Continuously monitor the post accident situation arising out of a major chemical accident and suggest measures for prevention and to check recurrence of such accidents;

- Conduct post-accident analysis of such major chemical accidents and evaluate responses;

- Review district off-site emergency plans with a view to examine its adequacy in accordance with the Manufacture, Storage and Import of Hazardous Chemicals, Rules, and suggest measures to reduce risks in the Industrial pockets;

- Review the progress reports submitted by the State Crisis Groups;

- Respond to queries addressed to it by the State Crisis Groups and the District Crisis Groups;

- Publish a State-wise list of experts and officials who are concerned" with the handling of chemical accidents; and

- Render, in the event of a chemical accident in a State, all financial and infra-structural help as may be necessary.

Chemicals Covered

Hazardous Chemicals covered are:

a. any chemical which satisfies any of the criteria laid down in Part I of Schedule I and is listed in Part II of this Schedule;

b. any chemical listed in Column 2 of Schedule II; and

c. any chemical listed in Column 2 of Schedule III; where,

Schedule I part I gives criteria for identifying toxic, flammable and explosive chemicals and part II lists 430 hazardous chemicals

Schedule II lists 25 chemicals and 2 categories along with threshold quantities

Schedule III lists 179 chemicals (Part I) and 3 categories (Part II) along with threshold quantities

Table 64: Overview of the Inter-ministerial Commissions and Coordinating Mechanisms

Name of the Mechanism	Responsibilities	Secretariat	Members
Consultative Group on Chemicals	Handling of matters related to international conventions – Basel Convention, Rotterdam Convention and Stockholm Convention and to help prepare national negotiations	Ministry of Environment & Forests	• Secretary, MoEF • Additional Secretary, MoEF • Additional Secretary and Financial • Joint Secretary, HSM Division, MoEF, Convenor • Adviser, MoEF • Chairman, CPCB • Joint Secretary, Ministry of External Affairs • Joint Secretary (Chemical), Department of Chemicals and Petrochemicals, Ministry of Chemical and Fertilisers • Joint Secretary (Plant Protection), Department of Agriculture and Cooperation, Ministry of Agriculture • Joint Secretary, Ministry of Health and Family Welfare • Joint Secretary (Commerce), Department of Commerce, Ministry of Commerce and Industry • Joint Secretary, Ministry of Shipping • Director, Industrial Toxicology Research Centre • Director, National Environmental Engineering Research Institute • Professor-In-Charge, Law Centre-II, Faculty of Law, University of Delhi • Head, Environmental Division, Confederation of Indian Industry • Chairman, SHE Committee, Indian Chemicals Manufacturers Association • Consultant, Ozone Cell • Adviser, MoEF • Joint Secretary, MoEF

Name of the Mechanism	Responsibilities	Secretariat	Members
Inter-ministerial Committee for the Review of Use of Insecticides and Hazardous Chemicals	To review the use of insecticides and hazardous chemicals	Department of Agricultural and Cooperation, Ministry of Agriculture	• Secretary, Department of Agriculture and Cooperation, Chairperson • Secretary, Department of Chemicals and Petrochemicals • Secretary, Department of Health • Secretary, Ministry of Environment & Forests
Central Crisis Group	• Monitor the post accident situation arising out of a major • Chemical accident and suggest measures for prevention and to check recurrence of such accidents • Responses • Review district off-site emergency plans with a view to examine its adequacy in accordance with the Manufacture, Storage and Import of Hazardous Chemicals, Rules, and suggest measures to reduce risks in the Industrial pockets	Ministry of Environment & Forests	• Secretary, Ministry of Environment & Forests • Joint Secretary / Adviser Ministry of Environment & Forests • Joint Secretary Ministry of Labour • Joint Secretary/ Adviser, Ministry of Chemical & Fertilisers • Director General, Civil Defence • Fire Advisor, Directorate General Civil Defence • Chief Controller of Explosive • Joint Secretary, Ministry of Industries • Director General, Indian Council of Medical Research • Joint Secretary Ministry of Health • Chairman, Central Pollution Control Board • Director General, Indian Council of Agriculture Research • Director General, Council of Scientific & Industrial Research • 4 Experts (Industrial Safety and Health)
	• Review the progress reports submitted by the State Crisis Groups		• Director General, Telecom • 2 Representatives of Industries to be nominated by the Central Govt.

Name of the Mechanism	Responsibilities	Secretariat	Members
			• Joint Secretary Ministry of Road Transport and Highways • General Manager, Rail safety • Advisor, Centre for Environment and Explosive safety • One Representative of Indian Chemical Manufacturers Association
Registration Committee for Insecticides	To register insecticide after scrutinising their formulae and verifying claims made by the importer or the manufacturer, as the case may be, as regards their efficacy and safety to human beings and animals	Department of Agriculture and Cooperation, Ministry of Agriculture	• Agriculture Commissioner, Department of Agriculture & Cooperation • Drug Controller General of India • Plant Protection Advisor to the Govt. of India • Asst. Director General, Indian Council of Agricultural Research • Additional Industrial Advisor, Ministry of Chemicals & Fertilisers • Asst. Director General, Ministry of Health & Family Welfare • Additional Director, HSM Division, Ministry of Environment & Forests • Secretary – Central Insecticides Board & Registration Committee • Agriculture Commissioner, Department of Agriculture & Cooperation • Drug Controller General of India • Plant Protection Advisor to the Govt. of India • Asst. Director General, Indian Council of Agricultural Research • Additional Industrial Advisor, Ministry of Chemicals & Fertilisers

Name of the Mechanism	Responsibilities	Secretariat	Members
			• Asst. Director General, Ministry of Health & Family Welfare • Additional Director, HSM Division, MOEF • Secretary – Central Insecticides Board & Registration Committee
Central Insecticides Board and Registration Committee	The risk to human beings or animals involved in the use of insecticides & safety measures necessary to prevent such risk	Department of Agriculture and Cooperation, Min. of Agriculture	• The Director-General of Health Service • The Drugs Controller, India • The Plant Protection Advisor to the Government of India • The Director of Storage and Inspection, Ministry of Food
	The manufacture, sale, storage, transport and distribution of insecticides with a view to ensure safety to human beings or animals.		• The Chief Advisor of Factories • The Director, National Institute of Communicable Diseases • The Director-General, Indian Council of Agricultural Research • The Director-General, Indian Council of Medical Research • The Director, Zoological Survey of India • The Director-General, Indian Standards Institutions • The Director-General of Shipping • The Joint-Director, Traffic (General) • Ministry of Railways (Railway Board) • The Secretary, Central Committee for Food Standards • The Animal Husbandry Commissioner • The Joint Commissioner (Fisheries) • The Deputy Inspector-General of Forest (Wild life)

Name of the Mechanism	Responsibilities	Secretariat	Members
			• The Industrial Advisor (Chemicals) • One person to represent the Ministry of Petroleum • One Pharmacologist • One Medical Toxicologist • One person who shall be in charge of the Department dealing with Public Health in a State • Two persons who shall be Directors of Agriculture in States • Four persons, one of whom shall be expert in Industrial Health and Occupational Hazards • One person to represent the Council of Scientific and Industrial Research and one Ecologist

7.2.3 Inter-Ministerial Committee for the Review of Use of Insecticides and Hazardous Chemicals

The Committee has been set up by the order of Supreme Court of India in 1997 to review the use of insecticides and hazardous chemicals. Following are the key members of the committee:

- Secretary, Department of Agriculture and Cooperation, Chairperson;
- Secretary, Department of Chemicals and Petrochemicals;
- Secretary, Department of Health; and
- Secretary, Ministry of Environment & Forests

Functions of the Inter Ministerial Committee

The committee reviews once every three months, the use of insecticides and chemicals found hazardous to health and take suitable remedial measures in this regard. The committee may take the assistance of technical experts, as may be considered necessary.

Chemicals Covered

- Insecticides and hazardous chemicals.

7.2.4 Central Insecticides Board

The Central Government has constitute Central Insecticides Board (CIB) under The Insecticides Act to advise the Central Government and State Governments on technical matters arising out of administration of this Act and to carry out the other function assigned to the board by or under this Act.

Functions of the CIB

The matters on which Board advises to the government are:

- The risk to human beings or animals involved in the use of insecticides and the safety measures necessary to prevent such risk;
- The manufacture, sale, storage, transport and distribution of insecticides with a view to ensure safety to human beings or animals.

Chemicals Covered:

- Insecticides and pesticides including fungicides and weedicides

7.2.5 Registration Committee for Insecticides (RC)

Under the Insecticides Act, Registration Committee is constituted out of members of Central Insecticides Board.

Functions of the RC

Functions of the RC is to register insecticide after scrutinising their formulae and verifying claims made by the importer or the manufacturer, as the case may be, as regards their efficacy and safety to human beings and animals

Chemicals Covered:

- Insecticides and pesticides including fungicides and weedicides

7.3 Description of Mechanisms for Obtaining Input from Non-Governmental Bodies

Non-governmental bodies especially industrial organisations are generally part of the inter-ministerial groups so that their inputs are taken appropriately in decision making including sharing of information, reporting, participation in planning and implementation of national chemical management plan and policies.

Out of the inter-ministerial groups discussed above, Consultative Group have ICC as well as CII members as part of the group; CCG also has ICC as member, CIB also have outside experts on board.

Relevant non-governmental organisations are discussed separately in detail in *Chapter 6*.

7.4 Comments / Analysis

- Existing coordinating mechanisms are working effectively, however, there is need to develop the database on such mechanisms so that data analysis can be done to find out gaps and improve functionality.

- These committees are generally constituted keeping in view the involvement and contribution of the ministries and agencies and their contribution are effective.

- These mechanisms cover all important aspects of chemicals which require inter-ministerial co-ordination and co-operation and further as and when required, concerned secretariat constitutes such mechanisms for effective functioning in the area of chemicals management.

- Where ever required existing mechanisms are linked with each other and also some of the mechanisms work separately.

- There is representation of parties from outside of government in all these mechanisms. These include industrial associations, NGOs, experts, etc.

- Information is shared across the different agencies charged with chemicals Management. Generally minutes of the meetings are circulated to all concerned. Also concerned websites also display relevant information.

CHAPTER 8

DATA ACCESS AND USE

8.1 Introduction

This chapter deals with availability of data for chemical management, assessing the data requirement and aims at identifying the gaps in data management including non-availability of reliable data, overlapping and conflicting information, access to international data bases, etc. Large amount of data related to chemicals management is generated at different locations by different organisations covering various stages – manufacture, storage, import, export, transportation, disposal, etc. Different types of databases are generated for different categories of chemicals. Most of the legal instruments related to chemical management require generation of data in different forms either by occupier or by authorities. In addition, initiatives by ministries and other government institutes also generate data from time to time meeting a specific requirement.

8.2 Availability of Data for National Chemicals Management

Table 65 provides an overview of data available for different decision making activities which are required under existing legal instruments for four categories of chemicals viz. Pesticides, Industrial Chemicals, Consumer Chemicals and Chemical wastes respectively. Availability is indicated in these tables by giving +++, ++ and + for good availability, fair availability and poor availability respectively. Blank indicates data is not available at all. As can be seen form the Tables, data availability varies from one chemical category to another and also within a category for different purposes. Consumer chemical category shows poor or no availability against various needs without any good availability. Whereas data availability is better in other categories like pesticides, industrial chemicals and chemical wastes.

8.3 Location of National Data

Table 66 indicates the nature of the national data related to chemicals management which, are available and to provide practical information on how to gain access to such data. Table indicates the data source, availability and accessibility. As can be seen from the Table, data are available and for most of the types at more than one location. Data sources are various and accessibility is restricted to concerned government departments. For others to access the data official channel needs to be followed.

8.4 Procedures for Collecting and Disseminating National / Local Data Chemical Management Data required by law

As can be seen from Chapter 4, various legal instruments applicable to chemicals management require occupiers to provide data to authorities in different forms. Different legal instruments require different reporting requirement.

Data reporting requirement under important legislation along with the flow of data is discussed in detail in Chapter 4.

Data on Effects of Chemicals on Health and Environment

Data is maintained on environmental and health aspects of chemicals, under various legal requirements as discussed in Chapter 4. Some of the important aspects are discussed below:

- MSIHC Rules make it mandatory for all occupiers to obtain or develop information on all the hazardous chemicals handled by him in the form of Material Safety Data Sheets. Such information includes health and environmental effect of chemicals. Also these rules require labelling of all hazardous chemicals to include physical, chemical and toxicology data.

- Under the Insecticides Act and Rules, occupier has to provide information on environmental and health effects of pesticide to the Registration Committee at the time of application of registration.

- EIA notification (1994) of MoEF requires project proponents to carry out environmental impact assessment (study) along with risk assessment and submit to authorities to obtain permission to set up a new project or expansion of the existing ones. Such studies are required for specific types of project meeting certain criteria as defined in the notification. These studies assess the environmental and health effect of the project due to pollution generation/chemical handling.

- Factories Act specifies the exposure limits to chemicals and toxic substances and lists 116 such substances along with their 15-minute and 8-hour exposure limits.

- Central Motor Vehicles Rules require class label to be displayed in a specified manner during transportation of hazardous chemicals indicating whether the substance transported is toxic, flammable or explosive.

Data Maintained by Government related to specific Chemicals / Group of Chemicals used in the Country

Various ministries / government bodies maintain data on chemicals / group of chemicals used in the country. Ministry of Environment & Forests is the nodal ministry for management of chemicals in the country and through various

studies and assignments generate data on hazardous chemicals including their handling at industries, isolated storages, transportation, etc.

As per MSIHC rules, MAH industries are identified based on their chemical handling (chemicals and quantities) by Chief Inspector of Factories / Director of Industrial Safety and Health at state level. Such industrial units are covered by MoEF under their Rapid Safety Audit and Hazard Analysis studies to generate data on unit wise handling of hazardous chemicals, their quantities and characteristics, consequence analysis indicating hazard zones chemical wise and other related matter. Most of the districts with large concentration of MAH industries have already been covered and data is available with Ministry.

MoEF has also got prepared Country Reports for MAH Industries and Isolated Storages containing all the chemical data for all the industries and isolated storages (MAH) in the country along with other pertinent information.

MoEF has also got conducted studies on “Vulnerability and Risk assessment of Transportation of Hazardous Chemicals” covering critical highway stretches. Such studies have generated data on transportation of hazardous chemicals on identified stretches, accident statistics and reviewed the compliance status.

Under MISHC rules, importation of hazardous chemicals requires permission from concerned authorities and these authorities maintain data on hazardous chemicals imported into country.

Central Insecticide Board and Registration Committee (CIBRC) registers all the pesticides manufactured/imported in country and maintains relevant data for all such chemicals. In addition, during licensing pesticide data along with quantities and location are also recorded.

Pollution Control Boards / Committees maintain data for all the industries seeking consent to operate under air and water act and also authorisation under Hazardous Waste (Management and Handling) Rules. In addition, data on transportation of hazardous wastes are also maintained by them.

Department of Explosives maintains all the data related to explosives and petroleum products including manufacture, import, sale, use, transportation, storage, handling etc.

Access to Relevant Data

As can be seen from the above, large amount of data are collected on chemical management by various government bodies. Such data are generated for specific purposes by a governmental body and used for its own work. Data storage and management practice also vary from one department to another. Many of the governmental departments have computerised their data storage system making it easy to store and retrieve, whereas still some others are maintaining it in files and paper form. Data are generally available to the users within the department; however, accessibility is restricted to the

outsiders even for other government departments. This would generally require follow up of official procedure, i.e. written request to the concerning officer/head specifying the purpose for which data is required.

8.5 Availability of International Literature

International literature from various Multilateral Agencies such as the WHO, World Bank, ADB, UNEP, USAID, APCTT are available readily on internet. As can be seen from **Table 67**, all the literature from such agencies is available to all, with free access. Table identifies the location of such literature in terms of their internet addresses.

8.6 Availability of International Databases

Regarding availability of international databases, **Table 68** may be referred. These are also available on internet with free access to all users. Locations have been identified in the Table.

8.7 National Information Exchange System

As can be seen from above referred Tables, general international literature and databases are accessible to all on internet facilitating information flow from international organisations to all concerned parties in India. More specific / confidential information from international sources is dealt with respective local department either by email, access to restricted areas of websites, exchange of documents, etc. Ministry of Labour is the nodal ministry for all matters related to ILO, Health Ministry deals with WHO, MoEF deals with UNEP for various Conventions and Treaties related to Chemical Management and they have their own information exchange system.

Exchange of national information among various ministries, other institutions and other concerned parties is also facilitated through internet. All ministries and departments functioning under them have their own websites giving detailed information about the policies, activities, departments, officers, laws and many other related matters. In addition, many of the data bases are also hosted online such as status of environmental clearances on MoEF, list of registered recyclers on CPCB site, data on banned pesticides on CIBRC site.

8.8 Comments and Analysis

- As can be seen from **Table 65**, there are certain grey areas where quality or availability of data is not satisfactory especially in the case of consumer chemicals. “+” mark indicates poor availability of data and it is evident from the Tables about the specific areas where improvement is required. Table indicates the availability of national data, which shows that most of the data is available with concerned department / agency and is shared with other users on request only. However, with advancement of technology, most of the international data is available on internet (**Table 67 and 68**) and is in public domain so that all concerned have free access.

- Data availability is poor in the area of health of industrial workers. Industries do not share this data, generally, due to fear of reprisal. The option of making non-declaration as an offence can be considered by the government. Further medical officers of industries are a good source of data on health issues and should be encouraged to come forward and share information. Also major hospitals in industrial can provide substantial information in this regard. National Institute of Occupational Health (NIOH), Ahmedabad is collecting some useful data.

- Since the national data are available with concerned department and agencies, and there has never been any major effort to harmonise the data collected by different agencies for data analysis purpose, it is difficult to say whether data collected by different agencies contain conflicting information or not.

- Existing databases are either in paper form in various files with concerned departments or in computers of that particular department. Since accessibility is limited to the departmental users, there is little automation or querying facility. Some of the databases available on internet such as export/import data is automated ad can be queried to find the desired information.

- Certain efforts are going on to improve the data management in the country; however, improvement is required in this area. National Informatics Centre can play an important role to computerise the existing databases of various government departments.

- Access to international databases is sufficient as everything is available in public domain on internet.

- Mostly concerned parties have access to information as far as transferring of data from one government department to another is concerned. However, it becomes difficult for private to easily access and use the data collected by various governmental bodies. There is a need to structure the data management system so data more data can be shared through internet.

Table 65: Quality and Quantity of Available Information

Data needed for / to	Type of Data required	Pesticides	Industrial chemicals	Consumer Chemicals	Chemical Wastes
Priority Settings	Technical Data about the harmful effects	++	+++	++	++
	Internationally banned chemicals and reasons for banning	+++	+++	++	+++
	Locational Sensitivity – affected / sensitive areas where further usage can have serious environmental impacts	+	+		++
Assess Chemical Impacts Under Local Conditions	Technical Data about the harmful effects	+++	+++	+	+
	Internationally banned chemicals and reasons for banning	+++	+++	++	+++
	Locational Sensitivity – affected / sensitive areas where further usage can have serious environmental impacts	+	+	+	++
Risk Assessment (Environment / Health)	Risk Assessment techniques	++	++		+
	Chemical Data - quantities, characteristics and storage and usage conditions, etc.	+++	+++		++
	Exposure Data - type of exposure and number of persons getting exposed	+	++		+
Classification / Labelling	Technical data, harmful effects, precautions to avoid exposure, emergency information in case of exposure	+++	+++	++	+++
Registration	Data for Registration of Chemicals	+++			+++

Data needed for / to	Type of Data required	Pesticides	Industrial chemicals	Consumer Chemicals	Chemical Wastes
Licensing / Permitting	Licensing / registration	+++	++	+	+++
Risk Reduction Decisions / practice	Technical Data including toxicity and exposure	++	++	-	+
Accident Preparedness and Response	Technical Data including toxicity, exposure and antidotes, infrastructure required and availability	++	++	+	+
Poisoning Control	Technical Data including toxicity and exposure	+++	++	-	+
Emission Inventories	Emission data as collected by Pollution Control Boards during grant of consent under air act, water act and authorisation under hazardous waste management and handling rules	++	++	+	+++
Inspection and Audits (Environment / Health)	Inspections by Regulators	++	+++	+	++
	Annual Environmental Statement as per EP Rules	+	+		
Information to Workers	Conduct of training and awareness programs for workers by occupiers	++	+	-	+
Information to the Public	Conduct of Awareness Programs for general public, labelling, leaflets, etc.	++	+	+	+

Table 66: Location of National Data

Type of Data	Location(s)	Data Source	Who has Access	How to Gain Access	Format
Production Statistics	Concerned Departments/Ministries for different products such as Department of Fertilisers for fertiliser production in India; Ministry of Petroleum and Natural Gas for Petroleum Statistics, CIBRC for Pesticides and Industry associations etc.	Available with concerned Ministries / Departments / Industry associations/ Planning Commission etc.	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers / paper files / registers
Import Statistics	http://commerce.nic.in/eidb/default.asp	Export Import Databank, Department of Commerce, Ministry of Commerce and Industry	All	open access	searchable database
Export Statistics	http://commerce.nic.in/eidb/default.asp	Export Import Databank, Department of Commerce, Ministry if Commerce and Industry	All	open access	searchable database
Chemical Use Statistics	Concerned Departments / Ministries for different products such as Department of Fertilisers for fertiliser production in India; Ministry of Petroleum and Natural Gas for Petroleum Statistics, CIBRC for Pesticides, etc.	Available with concerned Ministries/Departments	Actual users mainly the department / ministry plus other concerned bodies	Officially available for some	Computers / paper files / registers
Industrial Accident Reports	Chief Inspector of Factories / Director of Industrial Safety and Health at State headquarters plus DGFASLI at Mumbai, CCG etc.	Reports from occupier/factories inspectors at local level under Factories Act	Actual users mainly the department / ministry plus other concerned bodies	Officially available but not effective	Computers / paper files / registers

Type of Data	Location(s)	Data Source	Who has Access	How to Gain Access	Format
Transport Accident Reports	No centralised Data - Police Department keeps records of transport accidents, however difficult to make out about the type of chemical involved	Police Investigation report	Actual users mainly the department / ministry plus other concerned bodies	Officially available but not effective	Computers / paper files / registers
Occupational Health Data (Agricultural)	Not Available				
Occupational Health Data (Industrial)	Chief Inspector of Factories/Director of Industrial Safety and Health at State headquarters plus DGFASLI at Mumbai/ Labour Office at Shimla (statistics)	Reports from occupier/factories inspectors at local level under Factories Act	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers / paper files / registers
Poisoning Statistics	National Poison Control Centre established at AIMS	National Poison Control Centre, AIMS			Computers / paper files / registers
Pollutant Release and Transfer Register	Pollution Control Boards and Committees at State Headquarters and UTs	Consent Data as applied by industries	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers / paper files / registers
Hazardous Waste Data	Pollution Control Boards and Committees at State Headquarters and UTs / Ministry of Environment & Forests has developed a Web-based National Hazardous Waste Information System (http://164.100.194.13/servlet/)	Authorisation Data as applied by industries	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers/ Internet

Type of Data	Location(s)	Data Source	Who has Access	How to Gain Access	Format
Register of Pesticides	CIBRC, Faridabad	Available with concerned Ministries/Departments	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers / paper files / registers
Register of Toxic Chemicals	National Register established for India and Regional Registers being set up under the UNEP International Register of Potentially Toxic Chemicals (IRPTC) project.				
Inventory of Existing Chemicals	Not available as a single data source. Multiple sources would need to be consulted and still may not yield the total result.	Multiple sources- Factory Licenses, Isolated Storage Registers under the MSIHC Rules with Pollution Control Boards etc.	Actual users mainly the department / ministry plus other concerned bodies	Identify the source of data and contact officially	Computers / paper files / registers
Register of Imports	Chief Controller for Imports and Exports- all categories may not be possible to obtain.	Export Import Databank, Department of Commerce, Ministry of Commerce and Industry	All	open access	Computers
Register of Producers	DG FASLI- Mumbai (only for Factories registered under the Factories Act)- will not cover warehouses and possibly isolated storages.	Factories License (under the Factories Act) obtained from each state and compiled centrally	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers / paper files / registers

Type of Data	Location(s)	Data Source	Who has Access	How to Gain Access	Format
	Large Industry Associations such as CII, ICC and FICCI. In addition, local associations such as Bulk Drug Manufacturers Associations, Dye Manufacturers Association etc. and other such bodies also keep lists of members/ producers.	Annual Report/ brochure and listing of members	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers / paper files / registers
	State Pollution Control Boards	Licenses under Air Act and water Act and authorisation under Hazardous waste Management and Handling rules		Officially available	Computers / paper files / registers
	Ministry of Chemicals and Fertilisers for chemicals and fertilisers, CIBRC for Pesticides, Ministry of Petroleum and Natural Gas for refinery / petrochemicals etc.	Available with concerned Ministries/Departments	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers / paper files /registers
PIC Decisions	Department of Chemicals, Ministry of Chemicals and Fertilisers for Chemicals and Ministry of Agriculture for Pesticides	International data and various local data bases	Actual users mainly the department / ministry plus other concerned bodies	Officially available	Computers / paper files / registers
POPs Decisions	HSM Division, MoEF	POPs inventorization study - under finalisation	Ministry of Environment & Forests	Officially available	Computers / paper files

Table 67: Availability of International Literature

Literature	Location(s)	Who Has Access?	How to Gain Access
Environmental Health Criteria Documents (WHO)	http://www.who.int/ipcs/publications/ehc/en/	All	through internet
Health and Safety Guides (WHO)	http://www.inchem.org/pages/hsg.html	All	through internet
International Chemical Safety Data Cards (IPCS/EC)	http://www.inchem.org/pages/icsc.html	All	through internet
Decision Guidance Documents for PIC Chemicals (FAO/UNEP)	http://www.pic.int/en/DGDs/	All	through internet
FAO/WHO Pesticides Safety Data Sheets	http://www.inchem.org/pages/pds.html	All	through internet
Documents from the FAO/WHO Joint Meeting on Pesticide Residues	http://www.who.int/ipcs/food/jmpr/en/	All	through internet
Material Safety Data Sheets (Industry)	Free MSDS available on internet on several sites; ICC also publishes MSDS, Industry also keep MSDS for chemicals they are handling; CPCB is compiling MSDS of commonly used chemicals	All	through internet, purchasing copies from ICC/CPCB and industry also get MSDS from manufacturer/suppliers of chemicals
OECD Guidelines for the Testing of Chemicals	Priced Publications, can be bought from: http://www.oecdbookshop.org/	All	through internet and mail order
Good Laboratory Practice Principles	http://www.oecd.org/document/63/0,2340,en_2649_34381_2346175_1_1_1_1,00.html	All	through internet
Good Manufacturing Practice Principles	http://www.who.int/en/	All	through internet
WHO/UNEP Global Env. Library Network	www.unep.org/infoterra/	All	through internet

Table 68: Availability of International Databases

Database	Locations(s)	Who has Access?	How to Gain Access
IRPTC	http://www.chem.unep.ch/irptc/default.htm	All	Internet
ILO CIS	http://www.ilo.org/public/english/protection/safework/cis/index.htm	All	Internet
IPCS INTOX	http://www.intox.org/databank/index.htm	All	Internet
Chemical Abstract Services Database	http://www.cas.org/	All	Internet
Global Information Network on Chemicals (GINC)	http://www.nihs.go.jp/GINC/	All	Internet
STN Database	http://www.cas.org/ONLINE/DBSS/dbsslist.html	All	Internet

CHAPTER 9

TECHNICAL INFRASTRUCTURE

9.1 Overview of Laboratory Infrastructure

For the purpose of supporting programmes and policies for the management of chemicals, there are numerous Institutes or laboratories spread over the country and with varying capability. The parameters of importance include:

- Quality of chemicals;
- Residue analysis;
- Identification of unknown substances; and
- Capability to monitor possible adverse effects

Details of Institutes / Laboratories recognised by the following agencies are provided in **Tables 69 to Table 75**.

- The Central Pollution Control Board under the Environment (Protection) Act 1986
- The Ministry of Science and Technology, Council for Scientific and Industrial Research (CSIR)
- The Ministry of Agriculture (National level and state level Institutes, Bureaus, Project Offices etc.)
- Bureau of Indian Standards (BIS)
- Central Board for Excise and Customs (Central Revenue Laboratories)
- Centre for Explosive Safety (CEES), Ministry of Defence
- Ministry of Labour
- The National Accreditation Board for Laboratories (NABL)

There is no single laboratory accreditation facility for chemicals management in India. A National Accreditation Board for Laboratories (NABL) has been set up by the Government (Ministry of Science and Technology), though accreditation by NABL is voluntary and not compulsory. More and more laboratories are recognising the importance of accreditation and are planning NABL accreditation in the future.

The Central Pollution Control Board accredits laboratories under the Environment (Protection) Act 1986, Section 12(1) B. The CPCB has listed precise criteria for short-listing laboratories based on equipment available, size, manpower and various other criteria. The criterion is based on analysis of wastes and pollutants rather than basic chemical synthesis. A list of CPCB approved laboratories is given in **Table 69**.

The Institutes / Laboratories set up by the Government of India (Ministry of Science and Technology) under the CSIR (Council for Scientific and Industrial Research) and are capable of undertaking basic chemical analysis. A list of CSIR Institutes/ laboratories is given in **Table 70**.

Institutes/ laboratories set up by the Ministry of Agriculture include Universities, Research Centres, Bureaus, Project Directorates and other Institutions; these are capable of analysing agro chemical compositions and crops / seeds analysis. A list of centrally funded Ministry of Agriculture Institutes / Laboratories at the Central level is given in **Table 71** and state funded ones in **Table 72.**

Laboratories accredited by the Bureau of Indian Standards for chemical analysis are also listed in **Table 73.**

Laboratories established under Central Revenue Laboratories established under the Central Board for excise and Customs have an important role in analysing hazardous waste and other chemicals entering the country (Basel convention on trans-boundary movement of hazardous waste issues). A list of these laboratories is given in **Table 74**.

The major universities and research institutes having strong chemical analytical capability are also listed as a group in **Table 75**. These Institutes have well known departments of chemistry and chemical technology / engineering compounded with good in house Research and Development activity. There are more universities and colleges in the country that also have good basic chemical analysis capability.

The Ministry of Labour has established Laboratories at state level headquarters (for Occupational Health purposes) in each state; these are capable of undertaking basic analysis for occupational hygiene.

Laboratories established by the Centre for Environmental Explosive Safety (CEES) under the Ministry of Defence also exist for the purpose of testing of explosives/ explosive charges/ detonators/ fuses etc., some of these are accredited by the NABL.

It must be also recognised that there are also several large private test laboratories (such as Shriram Institute for Industrial Research (Delhi), Vimta Laboratories, Hyderabad), some large laboratories with large Corporates (such as Indian Oil Corporation Ltd. (IOCL), Indian Petrochemicals Corporation Ltd. (IPCL), Reliance Industries Ltd. and others.) that do not as such appear in the CPCB list, though they are high standard laboratories capable of full chemical and waste analysis.

The laboratories mentioned in these tables utilise internationally accepted protocols for chemical and wastes / pollutants testing. The protocols used include those under the OECD, the US Environment Protection Agency and other internationally accepted ones. The CPCB has also notified its own sets of testing protocols for environmental sampling.

There are co-operation programmes on between countries to improve the laboratory infrastructure in the country. An Indo Canadian Project for assessing the capability of Customs Laboratories last year and providing funding for infrastructure development has been recently completed.

9.2 Government Information System / Computer Capability

Being the Information Technology wing of the Government of India, the National Informatics Centre (NIC) regularly undertakes the job of computerisation of Government Departments, Ministries and the Offices of other related organisations. Complete Office Automation is carried out, right from conducting software requirement specification and site preparation to procuring and installing all necessary hardware and customised software. NIC endeavours to provide complete MIS Support to the User organisation and keeps updating the Users on their information requirements from time to time. It also implements projects on a turnkey basis, wherein NIC provides the services at no profit (cost plus) , thus ensuring enormous savings to the Users as compared to what would be charged by the commercial hardware and software consultants.

The automation of Government Offices, carried out by NIC over time, has resulted in a substantial transformation of the decision making process from the usual typing-oriented methods, to hi-tech word processing, with concomitant benefits in the form of improved staff productivity, better quality documents and faster dissemination of information. The Office Automation also includes providing electronic mail services to the Users, ideal for achieving a fast pace of communication and lessening the cumbersome postal delays.

Office Procedure Automation

Office Procedure Automation (OPA) is a comprehensive package developed to help monitor and assist in easy tracking of letters and files. It is an integrated package which gives administrative support right from diarising of receipts, updating its status, opening of new files, the various movements of the files, despatch of letters/files and finally record management. The package has been developed after studying the working of Government offices, the Manual of Office Procedure and extensive discussions with various users. This package has been refined over several years of constant use and feedback. It is supported by a powerful query which makes retrieval of data and information easy, based on any parameter. It is available in different platforms like Oracle, DB2 / UDB and SQL Server, etc. The package is fully operational in the Ministry of Civil Aviation, Dept. of Atomic Energy and 17 other Ministries/ Departments. It is also fully operational in the Cabinet Secretariat since 1999 and partially implemented in 18 Ministries / Departments in the Client Server mode. It is under implementation in all Ministries / Departments and Offices under Central Government and also in various State government offices

The officers of various ministries have been provided with a personal computer with Microsoft Windows operating system and having MS office tools such as Word, Excel, Power Point, etc. These computers are maintained by NIC teams or in-house maintenance sections. Over the period of time, the systems are regularly upgraded to prevailing configurations. All such computers have also been provided with a high-speed internet connection for web access an e-mail. Officers in the state ministries and departments such as the pollution control boards and also factories department have been provided with computers with above mentioned configurations. The computers are mainly used for day-to-day activities such as correspondence, report preparation, maintenance of different databases and preparation of presentations. National and international data and information access from the World Wide Web and communication through e-mails is also few of the major uses. Additionally, some of the high end computers and servers are also used for maintenance of large databases and running technical applications specific to the ministry.

Since all the systems have similar operating systems and also access to web and e-mail, they are compatible for exchange of data and information.

Section 8.2 and 8.3 in Chapter 8 describes various existing databases maintained by different Departments / Ministries.

9.3 Technical Training and Educational Programs

This section provides information on the Training and educational programs aimed at developing technical expertise required to implement:

a) Government Policies

b) Chemical Management covering

- Chemistry;
- Toxicology;
- Environmental sciences; and
- Environmental engineering

c) Information on such programs conducted at:

- Technical schools;
- Universities; and
- Specific programmes available to government employees

There are no specific educational institutions providing courses on implementing of government policy. Courses are available in public administration, environment management, environmental science, environmental law, toxicology, environmental engineering, chemistry, chemical engineering, bio chemical engineering, public health and many other

areas related directly or indirectly to chemicals management. Almost all major science universities have strong chemistry departments and courses leading to Bachelors and Masters of Science are available. Specialisation in chemistry is also possible including up to PhD level.

Chemistry is also covered at the school level and is a popular subject. Environmental Sciences are covered in many universities and colleges and many private colleges offering diplomas and recognised degrees in Environmental Science and Engineering are available. The institutes and courses are recognised by the All India Council for Technical Education (AICTE), an autonomous body under the Ministry of Education, Government of India.

Government employees are trained at various training centres such as the Indian Institute of Public Administration at Dehradun, training centres set up by the Government or held at Government funded universities, ASCI or the Administrative Staff College of India Hyderabad (where a wide range of subjects right from public administration to chemical safety is taught), EPTRI or the Environment Protection Training & Research Institute of India (for environment management) and many other Institutes such as the Institutes of Science, Bangalore, the Indian Institutes of Technology (IITs) and many others. Factory department employees are trained periodically and some of those involved in chemicals management are also trained abroad under organisations such as the International Labour Organisation (ILO) and others.

There are many colleges offering Environmental science and engineering.

9.4 Emergency Response Centres (ERCs)

MoEF has set up Emergency Response Centres (ERC) in the following locations viz:

- Mahad, Maharashtra
- Manali, Tamil Nadu
- Bhopal, Madhya Pradesh
- Vishakhapatnam, Andhra Pradesh
- Hyderabad, Andhra Pradesh

This is a voluntary scheme and is instituted in the larger interest of environment. The ERC establishes link among industries, expert crisis groups and expert environmental agencies during the crisis situation to ensure proper mitigative measures for any possible accident and control the scenario in case of an accident. These Centres are set up on mutual cost sharing basis (equity participation) with 50% share from the State Government and 50% from the beneficiary or member units.

The ERCs maintains technical information including safe isolation distances during chemical mishap, data on Major Accident Hazard (MAH) units, contact

addresses of relevant agencies, etc. They coordinate with the State Crisis Group (SCG), District Crisis Group (DCG), and the Local Crisis Group (LCG) during the chemical emergency. They organise programmes at various levels in the State to bring awareness among the common citizens regarding hazards associated with handling and management of chemicals and the associated safety aspects for prevention and mitigation of possible chemical mishaps.

9.5 Comments / Analysis

- Laboratories are spread across the length and breadth of the country and there are no major regional imbalances requiring specific attention.

- Intra - and Inter - Laboratory Quality Assurance (QA) programmes are necessary to ensure precision and quality in the analyses undertaken. Laboratories, even though recognised by the Government of India, should be advised strongly to go for NABL accreditation and other international accreditation for maintaining the recognition. Reproducibility of results, error margins, accuracy and other precision topics need to be addressed.

- Standard Reference chemicals are high cost materials and their availability is insufficient. Mechanisms to ensure their availability need to be put into place.

- Analysis protocols are generally in place and these are widely available over the Internet. Laboratory grade analysis chemicals are available on demand.

- Environmental and chemicals management education is available across the country. However, additional modules on quality and precision control techniques may be introduced for laboratory chemists, technicians and other support services.

- There is need to improve the infrastructure in emergency management including setting up of more ERCs in the critical areas with large concentration of chemical industries.

- A large percentage of chemical accidents happen during transportation of chemicals, therefore, it is important to ensure safe transportation of chemicals by providing adequate infrastructure in terms of good road network. Particular routes need to be identified and earmarked for transportation of chemicals. There should be a separate registration of carriers of hazardous chemicals and the list of such vehicles shall be communicated to various agencies involved.

Table 69: Laboratories approved by Central Pollution Control Board under the Environment (Protection) Act

S. No.	Name and address	Equipment / Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis?	Accreditation by CPCB under section 12(1) B of EP Act	Certified GLP (Yes / No)	Other capabilities
1.	Chemical Laboratory, Gujarat Refinery, Indian Oil Corporation Ltd., PO Jawahar Nagar, Dist. Vadodara, Gujarat	√	√	√	Special crude/ petroleum product assay / distillation tests
2	Public Health Engineering Laboratory, Vadodara Municipal Corporation, Kadak Bazar, Sayajigunj, Vadodara	√	√	√	
3	Environmental Radiological Laboratory, Health Physics Division, Bhabha Atomic Research Centre, Health Physics Division, KAPP P.O. Anumala, Dist. Surat - 394651 Gujarat	√	√	√	Special radiology tests
4	Zonal Office-Laboratory, Central Pollution Control Board, Zonal Office-Vadodara, Choksi Premises, Priya Laxmi Mill Road, Vadodara – 390003	√	√	√	
5	Zonal Office –Laboratory, Central Pollution Control Board, Zonal Office-Bangalore, 1st Floor, 6, West of Chord Road, II Stage, Rajaji Nagar, Bangalore - 560086	√	√	√	

S. No.	Name and address	Equipment / Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis?	Accreditation by CPCB under section 12(1) B of EP Act	Certified GLP (Yes / No)	Other capabilities
6	Pollution Control Analytical Laboratory, National Productivity Council, Utpadakta Bhawan, Lodhi Road, New Delhi - 110 003	√	√	√	
7	Central Laboratory Kerala State Pollution Control Board, Gandhi Nagar, Cochin-682020 Kerala	√	√	√	
8	Regional Laboratory Gujarat Pollution Control Board, Race Course Road, Vadodara	√	√	√	
9	Regional Laboratory Gujarat Pollution Control Board, 338, Belgium Square, Typical 1st Floor, Sliver Plaza Complex, Opp. Linen Bus Stand, Ring Road, Surat	√	√	√	
10	Regional Laboratory, Gujarat Pollution Control Board, Race Course Ring Road, Near Hotel Durgesh, Rajkot	√	√	√	
11	Quality Control Laboratory, Panipat Refinery, Indian Oil Corporation Limited, P. O. Panipat Refinery ,Distt. Panipat-132140 Haryana	√	√	√	Special crude/ petroleum product assay / distillation tests
12	Environmental Monitoring Laboratory, Bhilai Steel Plant Steel Authority of India Limited Bhilai-490001, Distt. Durg, MP	√	√	√	

S. No.	Name and address	Equipment / Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis?	Accreditation by CPCB under section 12(1) B of EP Act	Certified GLP (Yes / No)	Other capabilities
13	Environmental Laboratory Environmental Engineering Department, Rourkela Steel Plant Steel Authority of India Limited Rourkela-769011 Orissa	√	√	√	
14	Laboratory of Himachal Pradesh State Pollution Control Board S.C.F.-6-8,Sector-4, Parwanoo-173220	√	√	√	
15	Research & Development Department, Hindustan Copper Limited, Khetri copper Complex, P.O. Khetri Nagar-333504 Distt. Jhunjhunu, Rajasthan	√	√	√	
16	Process and Products Control Laboratory LPG/CSU Plant, ONGC, Mumbai Regional Business Centre Uran- 400 702 Maharashtra	√	√	√	
17	Chemical Laboratory, Ore Dressing Division, Indian Bureau of mines Plot No.I-8, MIDC, Hingna Rd, Nagpur –440016.	√	√	√	
18	Environmental Laboratory Central Mine Planning & Design Institute Limited, Gondwana Place, Kanke Road, Ranchi - 834008 Bihar	√	√	√	

S. No.	Name and address	Equipment / Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis?	Accreditation by CPCB under section 12(1) B of EP Act	Certified GLP (Yes / No)	Other capabilities
19	Hindustan Organic Chemicals Limited Laboratory, Hindustan Organic Chemicals Limited , Rasayani, Distt Raigad, Maharashtra	√	√	√	
20	Chemical Laboratory, PWD Ground and Surface Water Resources, Data Centre, Hydrology Division, PAP Campus, Pollachi – 642 003, Tamil Nadu	√	√	√	
21	Geo-chemical Laboratory Public Works Department Ground and Surface Water Resources, Data Centre Ground Water Division, Chennai - 600010 Tamil Nadu	√	√	√	
22	Geochemical Laboratory Public Works Department Hydrology Division, Ground and Surface Water Resources Data Centre, Mannapuram, Trichy-620020 Tamil Nadu	√	√	√	
23	Geochemical Laboratory Public Works Department Ground Water Division Ground and Surface Water Resources,Data Centre Pad Compound, Tallakulam Madurai-625002 Tamil Nadu	√	√	√	

S. No.	Name and address	Equipment / Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis?	Accreditation by CPCB under section 12(1) B of EP Act	Certified GLP (Yes / No)	Other capabilities
24	Environmental Engineering & Pollution Control Laboratory Central Pulp & Paper Research Institute, Post Box No.174 Paper Mills Road, Himmatnagar Saharanpur-247001 U.P.	√	√	√	
25	Centre for Environment Laboratory Institute of Post Graduate Studies & Research, Jawaharlal Nehru Technological University, Mahaveer Marg, Hyderabad-500028.A.P.	√	√	√	
26	Pollution Control Laboratory The Indian Iron & Steel Company Ltd. Burnpur- 13325,Distt.Burdwan West Bengal	√	√	√	
27	Central Laboratory Pollution Control Board, Assam Bamunimaidan, Guwahati-781021	√	√	√	
28	Pollution Control Research institute, BHEL, Ranipur, Hardwar-249403, Uttaranchal	√	√	√	
29	Department of Env. Science Laboratory, Bangalore University Jnanabharathy, Bangalore-560056	√	√	√	
30	Environmental Laboratory Durgapur Steel Plant, SAIL, Durgapur 713203	√	√	√	

S. No.	Name and address	Equipment / Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis?	Accreditation by CPCB under section 12(1) B of EP Act	Certified GLP (Yes / No)	Other capabilities
31	Central Lab and Analytical Section GSFC, PO Fertiliser nagar – 391750, Dist. Vadodara, Gujarat	√	√	√	
32	Laboratory of Pollution Control Cell Thane Municipal Corporation Dr. Alameda Road, Chandanwadi, Panchpakadi, Thane-400602, Maharashtra	√	√	√	
33	Lab of Punjab Pollution Control Cell, Vatavaran Bhawan Nabha Road, Patiala-147001, Punjab	√	√	√	
34	Central Laboratory UP Pollution Control Board PICUP Bhawan, 3rd floor, B-Block, Vibhuti Khand, Gomti Nagar, Lucknow-226 010, UP	√	√	√	
35	Central Pollution Control Board, Parivesh Bhavan, CBD-cum -office Complex, East Arjun Nagar, Delhi – 110 032	√	√	√	
36	National Fertilisers Limited Gohana Road, Panipat-132106, Haryana	√	√	√	
37	Environmental Science and Technology, Study Centre Laboratory, Bapuji Institute of Engineering &Tech. Davangere-577004,Karnatka	√	√	√	

S. No.	Name and address	Equipment / Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis?	Accreditation by CPCB under section 12(1) B of EP Act	Certified GLP (Yes / No)	Other capabilities
38	Environmental Engineering Laboratory, Richardson & Cruddas(1972) Ltd. 68B,69D,69E,SIDCO Industrial Estate Ambattur, Chennai	√	√	√	
39	Environmental Survey Laboratory Health Physics Division, Trombay Bhabha Atomic Research Centre, Mumbai-400085, Maharahstra	√	√	√	
40	Environment Protection and Training and Research 91/4 Gachibowli, Hyderabad, AP	√	√	√	
41	Central Laboratory, Gujarat Pollution Control Board, Sector 10ª, Gandhinagar-382010, Gujarat	√	√	√	
42	ITRC Laboratory, Industrial Toxicology Research Centre, Post Box No.80, Mahatma Gandhi Marg, Lucknow-226001,UP	√	√	√	Special toxicity studies/ assessments
43	Zonal laboratory, Central Pollution Control Board, Zonal Office-Kolkata, 247,Deshpran Seshmal Road, CIT Building,1st Floor Kolkata- 700033,West Bengal	√	√	√	
44	Environmental Engineering Laboratory, MECON limited, Vivekananda Path, Ranchi-834002, Jharkhand	√	√	√	

S. No.	Name and address	Equipment / Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis?	Accreditation by CPCB under section 12(1) B of EP Act	Certified GLP (Yes / No)	Other capabilities
45	Zonal Laboratory, Central Pollution Control Board, Zonal Office – Kanpur, 117/51,Q Block Sharda Nagar Kanpur-208025, UP	√	√	√	
46	Central Laboratory, Maharashtra Pollution Control Board, CIDCO Bhavan, 5th Floor, South Wing, Belapur, C.B.D., Navi Mumbai-400614	√	√	√	
47	Smelter Laboratory, National Aluminium Company Limited, Nalconagar-759145, Angul, Orissa	√	√	√	
48	Environment Management and Inorganic Chemicals Department Regional Research Laboratory CSIR- Bhubhaneshwar, Orissa	√	√	√	
49	Central Laboratory, State Pollution Control Board Orissa, Parivesh Bhavan, A/118,Nikanthanagar, Unit VIII, Bhubaneshwar-751012	√	√	√	
50	Central Laboratory Karnataka State Pollution Control Board, Nirman Bhawan Dr. Rajkumar Road, Rajaji Nagar Bangalore-560 010, Karnataka	√	√	√	
51	Regional Laboratory, Chattisgarh Environment Conservation Board Regional office, New HIG 9,10,11, Near Ring Road no.2 Tatibandh Raipur-429099, Chattisgarh	√	√	√	

Table 70: Institutes under the Council of Scientific and Industrial Research (CSIR)

S. No.	Name of the Institute	Equipment/ Analytical Capabilities available for chemical analysis?	Accreditation by Government of India, Ministry of Science and Technology	Certified GLP (Yes/No)	Other special capabilities
1	Central Food Technological Institute, Mysore, Karnataka	√	√	√	
2	Central Leather Research Institute, Adyar, Chennai, Tamil Nadu	√	√	√	
3	Central Salt and Marine Chemicals Research Institute, Bhavnagar, Gujarat	√	√	√	Fisheries, marine biology studies
4	Indian Institute of Chemical Technology, Uppal Road, Hyderabad, Andhra Pradesh	√	√	√	Chemical process technology
5	Indian Institute of Petroleum, Mokampur, Defraud, Uttaranchal	√	√	√	Petroleum assays, special oil and gas tests
6	Industrial Toxicological Research Centre, MG Marg, Lucknow, Uttar Pradesh	√	√	√	Toxicology studies
7	National Chemical Laboratory, Pune, Maharashtra	√	√	√	
8	National Environmental Engineering Research Institute, Nehru Marg, Nagpur, Maharashtra	√	√	√	
9	National Physical Laboratory, Dr. K.S. Krishnan Marg, New Delhi	√	√	√	

S. No.	Name of the Institute	Equipment/ Analytical Capabilities available for chemical analysis?	Accreditation by Government of India, Ministry of Science and Technology	Certified GLP (Yes/No)	Other special capabilities
10	Regional Research Laboratory, Hoshangabad Road, Habibganj Naka, Bhopal, Madhya Pradesh	√	√	√	
11	Regional Research Laboratory, Bhubaneshwar, Orissa	√	√	√	
12	Regional Research Laboratory, Jorhat, Assam	√	√	√	
13	Regional Research Laboratory, Canal Road, Jammu, Jammu and Kashmir	√	√	√	
14	Regional Research Laboratory, Thiruvananthapuram, Kerala	√	√	√	
15	Central Drug Research Institute, Lucknow, Uttar Pradesh	√	√	√	Drugs and Pharmaceuticals

Table 71: Central Institutes under the Ministry of Agriculture

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
1	Central Agricultural Research Institute, Port Blair (CARI) is mandated to provide a research base to improve the productivity of important agri-horticulture, livestock and fisheries of Andaman and Nicobar Islands through adaptive and basic research for attaining economic self-sufficiency.	√	√	√	Fisheries
2	Central Arid Zone Research Institute, Jodhpur, Rajasthan A unique multidisciplinary research organisation in South and South-East Asia having research facilities for over 30 different disciplines.	√	√	√	Arid zones and climate
3	Central Avian Research Institute, Izatnagar, Uttar Pradesh A premier institute in the field of poultry research, education, extension and training in India.	√	√	√	Poultry
4	Central Inland Fisheries Research Institute, Barrackpore, West Bengal The oldest premier research institution in the field of inland fisheries research and training in India.	√	√	√	Fisheries

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
5	Central Institute for Cotton Research, Nagpur, Maharashtra Its mission is to Improve production, productivity and quality of cotton through the development of ecologies for different agro climatic regions.	√	√	√	Cotton
6	Central Institute for Research on Goats, Farah, Uttar Pradesh A pioneer institute dedicated to the development of goats in India.	√	√	√	Goats
7	Central Institute for Research on Cotton Technology, Mumbai, Maharashtra An Institute engaged in research and development activities in cotton technology in India.	√	√	√	Cotton technology
8	Central Institute of Agricultural Engineering, Bhopal, MP. It aims to develop appropriate equipment and processes for modernisation of agriculture utilising animate and mechanical power sources, develop technology for reducing post harvest losses and add value to agro-produce through processing.	√	√	√	
9	Central Institute for Arid Horticulture, Bikaner, Rajasthan Its mandate is to conduct mission oriented research for improvement in productivity of horticultural crops and development	√	√	√	Arid zones and climate

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	of horticulture based cropping system under arid environment; and to act as a repository of information related to arid horticulture.				
10	Central Institute of Brackish water Aquaculture, Chennai, Tamil Nadu Mandated to conduct research for development of techno-economically viable and sustainable culture system for finfish and shellfish in brackish water.	√	√	√	Brackish water-fisheries
11	Central Institute of Freshwater Aquaculture, Bhubaneswar, Orissa Premier Research Institute on Freshwater Aquaculture in India.	√	√	√	Aquaculture, fisheries
12	Central Institute of Fisheries Education, Mumbai, Maharashtra First fisheries university in India mandated to conduct education and research programmes leading to post-graduate (M.F.Sc.) and doctoral (Ph.D.) degrees in specialised disciplines of fisheries science and technology.	√	√	√	Fisheries
13	Central Plantation Crops Research Institute, Kasaragod, Kerala Mandated to develop appropriate production, protection and processing technologies for coconut, arecanut	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	and cocoa through basic and applied research.				
14	Central Institute of Post Harvest Engineering & Technology, Ludhiana, Punjab A nodal institute for lead researches in the area of post harvest engineering and technology appropriate to the agricultural production catchments, agro-processing industries, pilot plants, industrial liaison, technology transfer and national and international cooperation to meet national needs.	√	√	√	
15	Central Marine Fisheries Research Institute, Kochi, Kerala The Premier Research Institute dedicated to Marine Fisheries Research	√	√	√	Fisheries
16	Central Research Institute for Dryland Agriculture, Hyderabad, AP	√	√	√	
17	Central Research Institute for Jute and Allied Fibre, Barrackpore, West Bengal Mandated to the Improvement of jute (C.Capsularis and C.olitorius) and allied fibre crops like mesta (H.Cannabinus and H.Sabdariffa), sun hemp, (Crotalaria Juncea), ramie (Boehmeria nivea) sisal (Agave sisalana) and flax (Linum usitatissimum) for yield and quality.	√	√	√	Jute

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
18	Central Rice Research Institute, Cuttack, Orissa Its main objective is to carry out research on basic and applied aspects in all disciplines of rice culture in order to devise ways and means of optimising hectare yields of rice.	√	√	√	Rice
19	Central Sheep & Wool Research Institute, Avikanagar, Rajasthan Its mandated to undertake basic and applied research in all disciplines relating to sheep and rabbit production.	√	√	√	Wool
20	Central Soil Salinity Research Institute, Karnal, Haryana Its mission is to generate new knowledge and understanding of the processes of reclamation and develop technologies for improving and sustaining the productivity of salty lands and waters.	√	√	√	Soil reclamation
21	Central Tuber Crops Research Institute, Thiruvananthapuram, Kerala Mandated to undertake basic, strategic and applied research for generating technologies to enhance productivity and utilisation potential of tuber crops (other than potato).	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
22	Indian Agricultural Research Institute, New Delhi The Indian Agricultural Research Institute (IARI) is the country's premier national Institute for agricultural research, education and extension. It has served the cause of science and society with distinction through first-rate research, generation of appropriate technologies and development of human resources.	√	√	√	
23	Indian Agricultural Statistics Research Institute New Delhi The Indian Agricultural Statistics Research Institute aims to promote and conduct research and education / training in Agricultural Statistics and Computer Applications and to advise, liaise with other Institutes who have a stake in strengthening of agricultural statistics system.	√	√	√	
24	ICAR Research Complex For Goa, Ela Old, Goa Mandated to conduct strategic and applied research on potential Agricultural and Horticultural crops, Livestock and Fisheries for improving productivity and post harvest management	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
25	Indian Grassland and Fodder Research Institute, Gwalior, Jhansi The Institute is mandated to organized research work on grassland and forages and during last four decades have achieved several commendable breakthroughs.	√	√	√	
26	Indian Institute of Horticultural Research, Bangalore, Karnataka Mandated to undertake basic and applied research for developing strategies to enhance Productivity and utilisation of tropical and subtropical horticultural crops viz., fruits, vegetables, ornamental, medicinal and aromatic and mushrooms	√	√	√	
27	Indian Institute of Pulses Research, Kanpur, Uttar Pradesh A national centre for basic and applied research on pulse crops: chickpea, pigeon pea, mungbean, urdbean, lentil, lathyrus, rajmah and field pea.	√	√	√	
28	Indian Institute of Soil Science , Bhopal, Madhya Pradesh In view of the fast changing scenario of Indian agriculture, and the growing importance of enhancing and sustaining productivity of soil	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	resource, the ICAR established the Indian Institute of Soil Science in 1988 at Bhopal to conduct basic and strategic research on this aspect.				
29	Indian Institute of Spices Research, Calicut, Kerala The Indian Institute of Spices Research (IISR), Calicut a constituent body of Indian Council of Agricultural Research (ICAR) is a major Institute devoted to research on spices.	√	√	√	
30	Indian Institute of Sugarcane Research, Lucknow, Uttar Pradesh It was established in 1952 for conducting research on fundamental and applied aspects of sugarcane culture as well as to co-ordinate the research work done on this crop in different States of the country.	√	√	√	
31	Indian Institute of Vegetable Research, Varanasi, Uttar Pradesh The project has been envisaged as a national network of multidisciplinary research on the improvement of the major vegetable crops.	√	√	√	
32	Indian Lac Research Institute, Namkum, Ranchi The only research Institute of its kind in the world, being devoted exclusively to all aspects of	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	lac research including its cultivation, processing, value addition and utilisation.				
33	National Academy of Agricultural Research Management, Hyderabad, Andhra Pradesh	√	√	√	
34	National Dairy Research Institute, Karnal, Haryana	√	√	√	
35	National Institute of Animal Nutrition and Physiology, Bangalore, Karnataka	√	√	√	
36	National Institute for Research on Jute & Allied Fibres Technology, West Bengal (formerly JTRL)	√	√	√	
37	Sugarcane Breeding Institute, Coimbatore, Tamil Nadu A pioneering breeding institute in the world, works to evolve superior varieties of sugarcane to cater to the needs of the various agro climatic zones in the country.	√	√	√	
38	Vivekanand Parvatiya Krishi Anusandhan Sansthan, Almora, Uttaranchal It is a premier institute of ICAR engaged in hill agricultural research for North-Western Himalayan region of India.	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	Bureaus				
1.	National Bureau of Animal Genetic Resources, Karnal, Haryana It is responsible for identification, evaluation, characterisation, conservation and utilisation of livestock and poultry genetic resources in India.	√	√	√	
2.	National Bureau of Fish Genetic Resources, Lucknow, Uttar Pradesh Mandated to collection, classification and evaluation of information on fish genetic resources of the country.	√	√	√	
3	National Bureau of Plant & Genetic Resource, New Delhi A nodal organisation for Plant Genetic Resource (PGR) activities in India.		√	√	
4.	National Bureau of Soil Survey & Land Use Planning, Nagpur, Maharashtra It was setup in 1976 with a mandate to provide a research input in the soil survey activities of the country and also carryout soil resource mapping programs at national, state and district level for land use planning.	√	√	√	
5	National Bureau of Agriculturally Important Micro organisms, Distt.	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	Mau, Uttar Pradesh The NBAIM has been established under the auspices of the Indian Council of Agricultural Research (ICAR) with the basic aim to promote and co-ordinate systematic scientific studies in agriculturally important micro organisms (AIMs) in order to improve the agricultural productivity.				
	National Research Centres				
1.	National Centre for Agri Economics & Policy Research, New Delhi Conducts Policy oriented research and strengthens agricultural economics research and teaching capability in state agricultural universities and ICAR institutes.		√		
2.	National Research Centre for Agro forestry, Jhansi, Uttar Pradesh Mandated to undertake basic and applied research for developing and delivering technologies based on sustainable agro forestry practices on farms, marginal and wastelands for different agro climatic zones in India.	√	√	√	Forestry
3	National Research Centre for Cashew, Puttur, Karnataka Mandated to increase production and productivity of cashew by evolving	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	high yielding varieties of cashew.				
4	National Research Centre on Camel, Bikaner, Rajasthan Mandated to undertake basic and applied research for improvement of camels.		√		
5	National Research Centre for Coldwater Fisheries, Bhimtal, Uttaranchal It is emerging as the nodal facility in the country where research investigations are under taken both on capture and culture aspects with a focus on exotic and Coldwater species.	√	√	√	Fisheries
6	National Research Centre on Equines, Hissar, Haryana A premier institute established under the aegis of Indian Council of Agricultural Research for conducting research on equine health and production.	√	√	√	
7	National Research Centre for Grapes, Pune, Maharashtra A premier Research Centre established to undertake mission oriented programme involving basic and strategic research for resolving the major biotic and abiotic constraints affecting the production and productivity of grapes.	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
8	National Research Centre for Groundnut, Junagadh, Gujarat	√	√	√	
9	National Research Centre for Integrated Pest Management, New Delhi Through the partnerships, NCIPM plans and conducts eco-friendly IPM research and development programmes which are essentially required for sustainable agriculture and environmental security.	√	√	√	
10	National Research Centre for Medicinal & Aromatic Plants, Boriavi, Gujarat Its mandate is to develop appropriate production, protection and processing technologies for important medicinal and aromatic plants through basic, strategic and applied research.	√	√	√	
11	National Research Centre for Mithun, Nagaland Established with objectives of protecting, preserving, evolving superior herd and developing location specific health and production technology for Mithun for the Mithun rearers of the country.		√		
12	National Research Centre for Mushroom, Solan, Himachal Pradesh	√	√	√	
13	National Research Centre for Onion and Garlic, Rajgurunagar, Pune,	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	Maharashtra National Research Centre for Onion and Garlic is a research centre of Indian Council of Agricultural Research (ICAR) under the Department of Agricultural Research and Education (DARE).				
14	National Research Centre for Oilpalm, Pedavegi, Andhra Pradesh A centre of excellence for conducting and coordinating research on all aspects of Oil Palm including conservation, improvement, production, protection, post-harvest technology, transfer of technology and human resource development.	√	√	√	
15	National Research Centre for Orchid, Pakyong, Sikkim For resolving major constraints in production of orchids and other bulbous ornamentals in major growing belt, the centre has mission mode approach.		√		
16	National Research Centre for Weed Science, Madhya Pradesh Mandated to undertake basic and applied research for developing strategies for efficient weed management in different agro-ecological zones	√	√	√	
17	National Research Centre for Yak, Dirang, Arunachal Pradesh Mandated	√	√	√	

S. No.	Main Institutes under the Ministry of Agriculture and major activities	Equipment / Analytical Capabilities available for agricultural analysis for seeds/ crops pesticides soil, water analysis/ climate issues / fisheries etc.	Accreditation by Govt. of India (Ministry of Agriculture)	Certified GLP (Yes / No)	Other special capabilities
	to conduct research on improvement of yak and its products through selection and breeding with exotic frozen semen and crossbreeding programme with BOS species.				
	Others				
1	Krishi Vigyan Kendra - Babhaleshwar, Maharashtra An Agricultural Extension project funded by ICAR for dissemination of technology, refinement and assessment of the available packages to suit the local environment.		√		
2	All India Coordinated Project of Micro and Secondary Nutrients and Pollutant Elements in Soils & Plants Its mission is Soil fertility management through balanced use of micro- and secondary- nutrients for enhancing and sustaining high crop productivity of soil resource with minimal environmental pollution.		√		

Table 72: State Agriculture Institutes under the Ministry of Agriculture

The SAUs are major partners in growth & development of Agricultural Research and Education under National Agricultural Research System.

S. No.	Name and Email Address	Address	Fax No.	Equipment / Analytical Capabilities available for agricultural analysis	Accreditation by Government of India	Certified GLP (Yes / No)
1	Acharya N G Ranga Agricultural University (ANGRAU) Email: angrau@ap.nic.in Website: www.angrau.net	Rajendranagar, Hyderabad Andhra Pradesh PIN 500030	040 - 24015031	√	√	√
2	Anand Agricultural University (AAU) Email: vc@aau.in Web Site: www.aau.in	Anand, Gujarat	02692 - 261520	√	√	√
3	Assam Agriculture University Email: vc@aau.ren.nic.in Web Site: www.aau.ac.in	Jorhat, Assam PIN 785013	0376-2340001	√	√	√
4	Bidhan Chandra Krishi Vishva Vidyalaya (BCKVV) Email: root@bckv.wb.nic.in	Haringhatta PO Mohanpur, Nadia WB PIN 741246	03473-222275	√	√	√
5	Birsa Agricultural University (BAU) Email: root@bau.bih.nic.in Web Site: www.bau.nic.in/	Kanke, Ranchi Jharkhand PIN 834006	0651-2455850	√	√	√
6	Central Agricultural University	JROISEMBA, Imphal, Manipur -795001	0385-2410450	√	√	√
7	Ch. Sarwan Kumar Krishi Vishwa Vidyalaya (CSKHPKV) Email: vc@hillagric.org Web Site: www.hillagric.org	Palampur, HP PIN 176062	01894-230465	√	√	√

S. No.	Name and Email Address	Address	Fax No.	Equipment / Analytical Capabilities available for agricultural analysis	Accreditation by Government of India	Certified GLP (Yes / No)
8	Chandra Shekhar Azad University of Agriculture & Technology (CSAUT) Email: csauknp@up.nic.in Web Site: csauk.ac.in	Kanpur, UP PIN 208002	0512-2210408	√	√	√
9	Ch Charan Singh Haryana Agricultural University (HAU) Email: root@hau.pnp.nic.in Web Site: hau.nic.in	Hissar, Haryana PIN 125004	01662-234952	√	√	√
10	Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth (KKV) Email: root@kkv.ren.nic.in	Dapoli, Maharashtra PIN 415712	02358-282074	√	√	√
11	Dr. Panjabrao Deshmukh Krishi Vishwa Vidyalaya (PKV) Email: vc@pdkv.mah.nic.in Web Site: pdkv.mah.nic.in	Krish Nagar, Akola, Maharashtra PIN 444104	0724-2258219	√	√	√
12	Dr. Yashwant Singh Parmar University of Horticulture & Forestry (YSPUH&F) Email: vc@yspuniversity.ac.in Web Site: www.yspuniversity.ac.in	Solan, HP PIN 173230	01792-252242, 52279	√	√	√
13	Govind Ballabh Pant University of Agriculture and Technology (GBPAU&T) Email: root@gbpuat.ernet.in Web Site: www.gbpuat.ac.in	Pantnagar, UP PIN 263145	05944-233473, 233500	√	√	√
14	Indira Gandhi Krishi Vishwa Vidyalaya (IGKVV) Email: adr@zrcmp01.mp.nic.in	Krishak Nagar, Raipur Chhattisgarh PIN 492012	0771-2442131, 2442302	√	√	√

S. No.	Name and Email Address	Address	Fax No.	Equipment / Analytical Capabilities available for agricultural analysis	Accreditation by Government of India	Certified GLP (Yes / No)
15	Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV) Email: root@jnau.mp.nic.in	Jabalpur, MP PIN 482004	0761-2481389,	√	√	√
16	Junagadh Agricultural University (JAU) Email:	Junagadh, Gujarat PIN 362001	0285-26702004	√	√	√
17	Kerala Agricultural University (KAU) Email: kauhqr@hub.nic.in Web Site: www.kau.edu	Vellanikkara, Trichur Kerala PIN 680654	0487-2370019	√	√	√
18	Maharana Pratap University of Agriculture & Technology(MPUAT) Email: vc@mpuat.ac.in Web Site: www.mpuat.ac.in	University Campus, Udaipur Rajasthan PIN 313001	0294-2470682	√	√	√
19	Maharashtra Animal Science & Fisheries Sciences University(MASFSU) Email:	Seminary Hills, Nagpur, Maharashtra PIN 440006	0712-2511282, 2511283	√	√	√
20	Mahatma Phule Krishi Vidyapeeth (MPKV), Email: kvmp@ren.nic.in Web Site: mpkv.mah.nic.in	Rahuri, Maharashtra	0246-243302	√	√	√
21	Marathwada Agricultural University(MAU) Email: mau@ren.nic.in	Parbhani, Maharashtra PIN 431402	02452-223582	√	√	√
22	Narendra Dev University of Agriculture and Technology (NDUAT), Email: nduat@up.nic.in	Faizabad, UP PIN 224229	5270-262097	√	√	√
23	Navsari Agricultural University (NAU)	Navsari, Gujarat	02637-283794	√	√	√

S. No.	Name and Email Address	Address	Fax No.	Equipment / Analytical Capabilities available for agricultural analysis	Accreditation by Government of India	Certified GLP (Yes / No)
24	Orissa University Of Agriculture & Technology (OUAT) Email: root@uat.ori.nic.in Web Site: bhub.ori.nic.in/ouat	Bhubaneshwar, Orissa PIN 751001	0674-2407780	√	√	√
25	Punjab Agricultural University (PAU) Email: root@pau.chd.nic.in	Ludhiana, Punjab PIN 141004	0161-2402483	√	√	√
26	Rajasthan Agricultural University (RAU) Email: root@raub.raj.nic.in	Bikaner, Rajasthan PIN 334002	0151-2202336	√	√	√
27	Rajendra Agricultural University (RAU) Email: rau@bih.nic.in	Pusa, Samastipur Bihar PIN 848125	06274-240266	√	√	√
28	Sardar Vallabh bhai Patel University of Agriculture & Technology (SVBPUAT) Email:	Modipuram, Meerut, UP PIN 250110	0121-2571941	√	√	√
29	Sardar Krushi Nagar- Dantiwada Agricultural University (SDAU)	Sardar Krishi Nagar, BK, Gujarat - 385506	02748-278261	√	√	√
30	Sher-e-Kashmir University of Agricultural Sciences & Technology (SKUAS&T, Jammu) Email: c_nsharma@rediffmail.com Web Site: www.skuastjammu.org	Camp Office, Railway Road, Jammu J & K PIN 180004	0191-2473883	√	√	√
31	Sher-e-Kashmir University of Agricultural Sciences & Technology (SKUAS&T, Kashmir) Email: anwar_alam@jk.nic.in, www.icar.org.in/sherk/welcome.htm	Post Box 262, GPO Srinagar Shalimar Campus Kashmir PIN 191121	0194-2462160	√	√	√

S. No.	Name and Email Address	Address	Fax No.	Equipment / Analytical Capabilities available for agricultural analysis	Accreditation by Government of India	Certified GLP (Yes / No)
32	Tamil Nadu Agricultural University (TNAU), Email: root@tnau.tn.nic.in Web Site: www.tnau.ac.in	Coimbatore, TN PIN 641003	0422-5511200	√	√	√
33	Tamil Nadu Veterinary & Animal Sciences University (TNU&ASU) Email: root@tnvasu.tn.nic.in	Chennai, TN PIN 600007	044-25551576	√	√	√
34	University of Agricultural Sciences (UAS) Web Site: uasbng.kar.nic.in	Bangalore, Karnataka PIN 560065	080-3330277	√	√	√
35	University of Agricultural Sciences (UAS) Email: root@uasd.kar.nic.in ,aris@uasd.net. www.uasd.net	Krishi Nagar, Dharwad Karnataka PIN 580005	0836-2448349, 748377	√	√	√
36	UP Pandit Deen Dayal Upadhyay Pashu chikitsa Vigyan Vishwavidyalaya edam Go Anusandhan Sansthan	Mathura, UP PIN 281001	0565-2404819	√	√	√
37	Uttar Banga Krishi Vishwavidyalaya (UBKV)	P.O. Pundibari, Distt. Cooch Behar WB PIN 736165	03582-270249, 270726	√	√	√
38	West Bengal University of Animal & Fishery Sciences (WBUA&FS)	68, Khudi Ram Bose Sarani, Belgachia Kolkata, WB		√	√	√

The ICAR has close collaboration with CGIAR system, World Bank, UNDP, FAO, SAARC, SAREC, CABI, ACIAR and Swedish Academy for Research Co-operation among Developing Countries. Among the CGIAR system the ICAR has entered into partnership with the ICRISAT, CIMMYT, IRRI, CIP, ICARDA and WARDA. In agro forestry the ICAR has entered into an agreement with the International Centre for Research in Agro forestry (ICRAF). India is a contributory member of the 12 nation Regional Network of Agricultural Machinery (RNAM) of the ESCAP, United Nations. India is also a contributory member of the inter-governmental 15-nation consortium NACA for aquaculture research and development in Asia and Pacific. A project on 'Plant Genetic Resources' is being implemented by the NBPGR through the support of the USAID.

Other countries actively seeking India's expertise in agriculture for mutual benefit are Mongolia, Syria, United Arab Emirates, Bangladesh, Nepal, Bulgaria, Mauritius, the Philippines, Vietnam, Iran, Pakistan, Siberia, Burkina Faso, Ghana, Eritrea, Namibia, Uzbekistan and Sri Lanka. MOUs have also been signed with Australia, Panama, Russia and France. A modern seed processing and storage facility and capabilities for further seed technological research has been established at Karnal with the help of Japan. The Department of Agricultural Research and Education (DARE), Ministry of Agriculture, Government of India, negotiates on behalf of the ICAR with foreign governments for bilateral and multilateral collaborative agreements.

Table 73: Institutes approved by BIS (BUREAU OF INDIAN STANDARDS)

S. No.	Institutes approved BIS (Bureau Of Indian Standards)	Equipment/ Analytical Capabilities available for Chemical analysis	Accreditation by BIS	Certified GLP (Yes / No)	Other special capabilities
1	Central Leather Research Institute, Kolkata	√	√	√	Tanneries/ Leather products
2	Central Food Technological Institute, Mysore, Karnataka	√	√	√	Food Products/ Hygiene
3	Indian institute of Technology, Kanpur	√	√	√	
4	Indian institute of Technology, Chennai	√	√	√	
5	Indian institute of Technology, Mumbai	√	√	√	
6	Industrial Toxicological Research Centre, MG Marg, Lucknow, U.P.	√	√	√	Toxicology
7	National Physical Laboratory, Dr. K.S. Krishnan Marg, New Delhi	√	√	√	
8	NSIC Technical Services Centre, Howrah, W.B.	√	√	√	
9	Punjab Agricultural University, Ludhiana	√	√	√	
10	Regional Testing Centre, Mumbai	√	√	√	
11	Process cum development Centre, Meerut	√	√	√	
12	Bhabha Atomic Research Centre	√	√	√	Nuclear/ Radiation

S. No.	Institutes approved BIS (Bureau Of Indian Standards)	Equipment/ Analytical Capabilities available for Chemical analysis	Accreditation by BIS	Certified GLP (Yes / No)	Other special capabilities
	(BARC), Kalpakkam				
13	BARC, Tarapur, Maharashtra	√	√	√	Nuclear/ Radiation
14	BARC, Trombay	√	√	√	Nuclear/ Radiation
15	BARC, Bulandshahr, M.P.	√	√	√	Nuclear/ Radiation
16	BARC, Trombay	√	√	√	Nuclear/ Radiation
17	BARC, Kota	√	√	√	Nuclear/ Radiation
18	BARC, Vyara	√	√	√	Nuclear/ Radiation
19	BARC, Karwar	√	√	√	Nuclear/ Radiation
20	School of Energy Studies, Madurai	√	√	√	
21	School of Energy Studies, Pune, Maharahstra	√	√	√	
22	School of Energy and Environment Studies, Indore	√	√	√	
23	NSIC Technical Services Centre, Rajkot, Gujarat	√	√	√	

Table 74: Central Revenues Control Laboratories (Customs)

S. No.	Name of Laboratory	Basic Equipment/ Analytical Capabilities available for chemical and waste analysis	Accreditation by Central Board of Excise and Customs (CBEC)	Certified GLP (Yes/No)
1	Central Revenue Control Laboratory, New Delhi	√	√	√
2	Chemical Laboratory, Custom House, Kolkata	√	√	√
3	Chemical Laboratory, New Custom House, Mumbai	√	√	√
4	Jawahar Custom House Laboratory, Nhava Sheva, Maharashtra	√	√	√
5	Custom House Laboratory, Marmagao	√	√	√
6	Custom House Laboratory, Rajaji Salai, Chennai	√	√	√
7	Custom House Laboratory, Cochin	√	√	√
8	Custom House Laboratory, Tuticorin	√	√	√
9	Custom House Laboratory, Ghandhidham	√	√	√
10	Air Cargo Complex, Sahar, Mumbai	√	√	√
11	Central Excise Laboratory, Vadodara	√	√	√

S. No.	Name of Laboratory	Basic Equipment/ Analytical Capabilities available for chemical and waste analysis	Accreditation by Central Board of Excise and Customs (CBEC)	Certified GLP (Yes/No)
12	Central Excise Laboratory, Matunga, Mumbai	√	√	√
13	Central Excise Laboratory, HPCL Refinery, Mahul, Mumbai	√	√	√
14	Central Excise Laboratory, HPCL Refinery, Vishakhapatnam	√	√	√
15	Central Excise Laboratory, Custom House, Vishakhapatnam	√	√	√
16	Central Excise Laboratory, Barauni Refinery, Bihar	√	√	√
17	Central Excise Laboratory, Assam Oil Company, Digboi, Assam	√	√	√
18	Govt. Opium & Alkaloid Works, Neemuch	√	√	√
19	Govt. Opium & Alkaloid Works, Ghazipur, UP			

Table 75: List of Major Universities / Institutions having Laboratory and R & D Facilities

S. No.	Name and Address	Complete Equipment/Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis	Recognised by Government of India, Ministry of Education	Certified GLP (Yes/No)
1	Indian Institute of Technology, Hauz Khas, New Delhi	√	√	√
2	Indian Institute of Technology, Powai, Mumbai	√	√	√
3	Indian Institute of Technology, Guwahati, Assam	√	√	√
4	Indian Institute of Technology, Guindy, Chennai	√	√	√
5	Indian Institute of Technology, Kharagpur, West Bengal	√	√	√
6	Indian Institute of Technology, Roorkee, Uttaranchal	√	√	√
7	Indian Institute of Technology, Kanpur, Uttar Pradesh	√	√	√
8	Birla Institute of Technology and Science, Pilani, Rajasthan	√	√	√
9	Birla Institute of Technology and Science, Ranchi, Jharkhand	√	√	√

S. No.	Name and Address	Complete Equipment/Analytical Capabilities Available for chemical and pollution (air, ground, water) analysis	Recognised by Government of India, Ministry of Education	Certified GLP (Yes/No)
10	Jadavpur University, Jadavpur, West Bengal	√	√	√
11	Motilal Engineering College	√	√	√
12	Hartcourt Butler Institute of Technology, Kanpur, UP	√	√	√
14	Anna University, Chennai	√	√	√
15	Andhra University, Hyderabad, AP	√	√	√
16	Delhi University, University North Campus, Delhi	√	√	√
17	University Department of Chemical Technology (UDCT), Chembur, Mumbai	√	√	√
18	Science college, University of Kolkata (Raja bazaar)	√	√	√

CHAPTER 10

CHEMICAL EMERGENCY PREPAREDNESS, RESPONSE AND FOLLOW-UP

10.1 Introduction

Emergencies may arise from industrial, transport or other incidents involving toxic substances, including waste. They may arise from accidental or deliberate contamination of food, drinking water or consumer goods. Such contamination may involve both chemicals of made-made or natural origin. Natural disasters may also provoke chemical emergencies, at times of earthquakes, floods or storms destroying facilities containing toxic materials, which are released into the environment; volcanoes emitting toxic fumes etc. Recently several countries have experienced chemical terrorism, the potential for which is ever present. These incidents may involve many people and animals, contaminating the environment, during which emergency response facilities and health services, already strained in many countries, are put under great pressure. Furthermore, the normal communications systems e.g. telephone may become blocked or inoperative during an emergency, and the capacity of regular transportation systems severely reduced.

10.2 Emergency Planning

Emergency Plans

The Ministry of Environment and Forests is the nodal ministry for chemical disasters and has played an active role in the process of enhancing emergency preparedness at all levels.

Various Ministries have been selected as Nodal agencies to deal with various types of emergencies or disasters. The Ministry of Home affairs (MHA) for Natural disasters, the Ministry of Agriculture for drought emergency, the Ministry of Civil Aviation for Air emergencies, the Ministry of Railways for Rail emergencies, the Ministry of Health for Biological emergencies and the Department of Atomic Energy for nuclear emergencies.

The UNDP has been actively supporting the Ministry of Home Affairs in the building up of overall emergency management and disaster recovery preparedness since over a decade and various projects strengthening infrastructure, institutions at the local, state and central level are already in place. Disaster Management agencies have been constituted and these are actively pursuing projects in the natural disaster prone area (earthquakes, floods, cyclones, draughts, tsunami etc.). Similarly, the other Ministries such as Railways, Civil Aviation, Health and Atomic Energy, have ongoing disaster prevention and mitigation projects. Disaster mitigation and prevention has received focus for the first time in the 10^{th} Five Year Plan for the period 2002-2007 in the wake of the large-scale natural disasters that struck in Gujarat and Orissa (earlier, only “relief’ was addressed).

Chemical Emergency Plans need to be in place at the industry, local, district, state and Central level for dealing with large-scale chemical emergencies. Various legislations and mechanisms are in place to ensure emergency preparedness at both the “book” level and also the “operational” level.

The legal framework in the country makes it mandatory for units handling hazardous chemicals to have an “Onsite Emergency Plan” in place. This provision exists in the Factories Act and the MSIHC Rules (see chapter-4).

Emergency preparedness at the next level is covered under the CAEPPR. These as on date, there are 1729 Major Accident Hazard Units (MAH) in 22 States / UTs (19 states and 3 UTs). As per the latest information, 1569 on-site plans and 137 Off-site plans have been prepared. All the states except Bihar and Jammu & Kashmir have constituted State Level Crisis Groups.

The actual content of the plans, their practicability, correctness, update status and their details are evaluated at different levels. The local level Inspector of Factories (mainly) and the Local Crisis Group members are primarily responsible for evaluation of the On-site Plan of the factory. The relevant hazard information in the Onsite Plans, particularly possible off-site consequences (extending beyond the factory gate) must be communicated to the District Authority (District Collector), who in turn is to prepare the “Off-site Emergency Plan”. The Ministry of Environment and Forests, has supported the District Collectors in the preparation of Offsite emergency Plans. So far, 137 Off-site Plans are available. Further efforts are on in this area, to eventually cover the major hazardous industrial districts across the country. The Off-site Plans detail the roles and responsibilities of various bodies including the fire and medical personnel, district authorities, police, civic agencies, members of the public, Non-government bodies and others.

It is recognised that Off-site planning has to be a live process- amendments to the plans have to be made on a periodic basis once data, such as telephone numbers, industry / chemical profile, key personnel, resources etc., are altered.

Roles and Responsibilities

The Off-site Plan details the various chemical emergency scenarios envisaged in the district - these include those arising from accidents within the Major Accident Hazard (MAH) Units and transportation incidents. The plan must describe in detail the specific technical and administrative actions to be taken in the event of a major chemical emergency. The plans are prepared either on behalf of the district collector either by the technical personnel in the district or through assistance from the Ministry of Environment and Forests. The process of plan preparation involves taking of inputs from various authorities including district authorities, police, fire services, local health officials, major hospitals and others. Several meetings and discussions are held for the purpose and this ensures that the plan prepared is effective and addresses real issues in a comprehensive manner.

The District Emergency Authority would be assisted by various officers from the Collectorate and other District or local bodies (fire brigade, hospitals, police, public works department, telephone services, electricity services etc.). The occupier of the

factory also has an important role to play in supplementing the Collectorate resources, particularly with respect to specialised chemical domain expertise. These are all detailed in the plans.

Conduct of Mock Drills

As per the CAEPPR, the DCG is responsible to review the onsite emergency plans prepared by occupiers of the units, monitor chemical accidents and conduct full-scale mock trials every year. The plans must be modified based on the lessons learnt from the Mock trials subsequently conducted.

As per the CAEPPR, the LCG is responsible to educate the population likely to be affected in a chemical accident and conduct one full-scale mock trial of a chemical accident every six months. The members of the local media are invited to attend the drills, including the post drill sessions for information dissemination. Training and building up awareness with the public likely to be affected by chemical incidents is also mandatory under the MSIHC Rules and has to be done by the occupier. However, where LCGs and DCGs are active, the training part is done by the LCG / DCG through various methods. Several other mechanisms aimed at creating mass awareness.

Inventories

The Ministry of Environment and Forests (MoEF) has a centralised inventory of hazardous chemicals through various studies it has had conducted, in addition to other routine and non- routine mechanisms such as:

- An "Inventorisation" study on "Isolated Storages" carried out during 2001-02 has identified 347 Isolated Storages in the country.

- An all India country report on MAH industries carried out in 2001-2002 and updated in 2004.

- Hazard analysis studies (includes Rapid Safety Audit and Hazard Analysis studies) of 85 industrialised pockets in the country (out of about 180 in total).

- Regular contact with the Directorate of Factories of all the States

Regarding transport routes at risk, the Ministry of Environment and Forests has identified several “stretches” in the country that carry high inventory of hazardous materials and has conducted “Vulnerability and Risk Assessment” studies for them. So far, 16 vulnerable stretches in the industrialised States of Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu have been taken up for study. The studies in particular point out weaknesses in the implementation of key legislation (such as the Central Motor Vehicles Rules), state of emergency preparedness for transport incidents, consequence analysis and connected issues. These stretches typically covered chemical traffic originating at major chemical ports through to industrial clusters and transit traffic along National Highway stretches. More stretches along the “Golden Quadrilateral” project are proposed for study in the coming years.

Emergency equipment

Emergency preparedness equipment such as protective clothing with fire service staff, police and other responders is an area of concern. As is known, the Personnel Protective Equipment (PPE) required for handling different chemical release varies considerably and the correct combination is important. Availability of a good range of PPE and PPE selection charts need attention across the country with the response agencies. In specific chemical clusters in Gujarat (such as Vapi, Vadodara and Ankleshwar) and Maharashtra (Raigad and Thane), major efforts have been made to equip the responders with the requisite PPE through assistance from the chemical industry. In general, this area requires attention across the country. The country report on MAH Units sponsored by the MoEF specifically describes in detail the resource scenario at a local District, State and National level.

Four Emergency Response Centres have been funded at Vadodra (Gujarat), Manali (Tamil Nadu), Bhopal (Madhya Pradesh) and Khopoli (Maharashtra) – these serve as a link between the DCG and the industry. The Emergency Response Centre (ERC) primarily deal with chemical emergencies in the area. The ERCs are also the Central agency in the area for dissemination of technical information relating to chemical hazards required to meet chemical emergencies. The centres also cater to transport accidents and also stock up PPE for various emergencies.

GHS (Globally Harmonised System) for Classification and Labeling of Chemicals

The GHS for Classification and Labelling of Chemicals has initiated activities aimed at meeting its obligations under the GHS by 2008.

Presently, the hazard identification system being followed for “general” hazardous materials is based on the standard UN system. The labels being adopted are detailed in Rule 137 of the Central Motor Vehicles Rules where various UN classes (explosives, gases, inflammable liquids, inflammable solids, oxidising substances and peroxides etc.) with separate sub-classes are identified and symbols adopted. These are to be in place on transport vehicles and the industry and transporters follow them. TREM (Transport Emergency) card formats are given n the CMVR, and Material Safety Data Sheet (MSDS) formats are given in the MSIHC Rules.

Materials that are covered under the Insecticides Act, the Petroleum Act, the Explosives Act (see Chapter-4) have to be labelled as set out under the respective Acts / Rules. There is cross-reference to these rules in the CMVR.

National Poison Information Centre

The National Poison Information Centre (NPIC) was set up in the Department of Pharmacology in 1995 at All India Institutes of Medical Science (AIIMS), New Delhi, funded by MoEF. The centre functions round the clock, 365 days in year and provides information on various poisonings and treatment protocols on telephone, fax, e-mail and in person. The NPIC has the back-up of latest literature on poisoning due to a variety of products that include household items, agricultural and industrial chemicals, drugs, environmental toxins including plants, animal bites and stings and other

miscellaneous products. The data received by Centre is compiled and analysed for knowing the trend.

Poison Control Centres are specialised units providing information on poisoning, and their main function is to provide information and advice concerning the diagnosis, prognosis, treatment and prevention of poisoning as well as information about the toxicity of chemicals and the risks they pose.

The following five poison control centres are also recognised by World Health Organisation:

i. The Poisions Information Centre, Department of Pharmacology, All India Institute of Medical Sciences (AIIMS), Ansari Nagar, New Delhi 110 029, Emergency telephone: +91 11 6859391; E-mail: skgupta@medinst.ernet.in, Fax: +91 11 6859391.

ii. The Poisons Information Centre, The Amrita Institute of Medical Sciences (AIMS), Elanakkar Post, Kochi, Kerala (webmaster@aimshospital.org- Tel: 0484-2801234/2804321)

iii. The Poisons Information Centre, National Institute of Occupational Health, Meghani Nagar Ahmedabad 380 016, E-mail: dewan@ad1.vsnl.net.in, Emergency telephone: +91 79 562 1400; Fax: +91 79 286 6630

iv. The Poisons Information Centre, The Toxicology & IMCU Unit, Government General Hospital, Chennai 600 003, E-mail:thiruma@satyam.net.in; Tel. No. +91 44 536 3208/ 5363131

v. The Poisons Information Centre, The Industrial Toxicology Research Centre. Post Box 80, M. Marg, Lucknow 226-001, E-mail: itrc@itrcindia.org , Tel. No: +91 0522-227586; Fax: 228227

The poison control centre also educate in the areas of :

- Updates medical professionals with regard to the current management of poisoning due to various products
- Trains consultant from India and neighbouring countries
- Creates awareness about various poisons in environment and their prevention
- Conducting awareness programmes: Lectures, Exhibitions, Poster painting by school children, distributing handouts, leaflets on various prevention aspects.

Local Hospitals

Local hospitals close to industrial clusters have been associated with the emergency management process at the local level. The role of the medical authorities in emergency management is well recognised and they form an integral part of the DCG / LCG. Though many hospitals close to the Industry clusters (or where victims from such clusters could be brought in for treatment) have some basic equipment for treatment of poisoning / burn / other cases, the inventorisation of the antidote stock, number of beds etc. and other related issues have not received sufficient attention. Chemical specific antidotes, decontamination facilities are not yet built up to the requisite level.

Ambulances are available at many of the major and middle level hospitals. Some large industries also maintain a basic ambulance service for shifting victims to the nearest medical centre. Apart from major and middle level hospitals, some NGOs, such as the Red Cross, St. John's Ambulance, Rotary Service, Lions Club and others, also provide ambulance services. These units often have trained paramedical staff that can provide first - aid and trauma - service prior to shifting to a full-fledged hospital.

Incident area clean - up

Incident area clean-up needs to be co-ordinated with the respective State Pollution Control Board at the local level. The local Inspector of Factories also suggests appropriate clean up measures, along with advice from prominent experts from the area, who have generally been identified in the various emergency plans.

Training

Training of fire service staff, police, civil defense agencies, medical and paramedical staff and other first responders in dealing with chemical emergencies is essential. Specialised, chemical and incident specific training systems are in place at the cluster level, organised by the District or Local Crisis Groups only in highly industrial clusters such as Ankleshwar, Vapi, Manali and others. For more generic type training, the state government through its departments organises training for fire fighting staff, medical and paramedical staff. State level Police academies organise specialised training for Police officers and policemen, with special modules on chemical management. Organisations such as the National Safety Council, National Chemical Council and other bodies also conduct special safety training programmes involving industry and first responders through their state and local chapters / action centres.

Training for veterinarians specifically concerning treatment of exposed animals to toxic substances has not been a focus area and needs attention.

10.3 Chemical Incident Response

India has witnessed some major chemical disasters, the largest being the Bhopal Gas tragedy that occurred in 1984. Several other important chemical accidents have occurred since then, including an LPG disaster at Hindusthan Petroleum Corporation Ltd., Vishakapatnam, a C2 / C3 disaster at Maharashtra Gas Cracker complex at

Nagothane, explosions at Panipat Refinery, Haryana, SO_2 release from Transpek Silox Industry Ltd. at Vadodara, PVC / warehouse fire at Lalkuan in Delhi, several fire cracker unit explosions and many others.

India does not yet have a comprehensive accident database management and updating system. Accident data remains scattered and with multiple agencies. Petroleum incidents, Explosive accidents, Factory incidents, Nuclear accidents, Mines incidents, Insecticides incidents and Port incidents are to be informed to the respective "authority" specified under various legislations (see chapter-4). As a result, accident data is not presently compiled at a central location. The MoEF, being the 'nodal" ministry for chemical accidents, is supposed to be notified on occurrence of any chemical incident. The mechanism for compiling and sharing information and data on accidents requires attention and this has been pointed out and minuted in the Central Crisis Group meetings held in 2004 and 2005. Subsequently, the MoEF is proposing to implement a system for keeping the accident data up to date electronically.

10.4 Chemical Incident Follow-up and Evaluation

This section is provided for a description of the procedures, if any, taken for the follow-up of a chemical incident, both in terms of exposed persons and the environment with rehabilitation measures, and for the evaluation so as to improve preparedness and response in the future.

The reporting of accidents is mandatory under various laws. The important accident reporting forms are given under various Acts / Rules, such as the MSIHC Rules, The Factories Act, Dock (Safety, Health and Welfare) Act, the Oil Mines Regulations, Atomic Energy Factory Rules, Petroleum Act, Explosives Act, Insecticides Act and others.

These laws also mandate thorough investigation of the incident with no delay by the respective Inspectors. Root cause analysis is attempted and incident investigation and communication is in-built in the overall process. The investigations could lead to a formal enquiry on the incident causes, responsibilities of various parties involved and also possible follow up studies/ investigations. For example, incidents in the oil sector are investigated also by the Oil Industry Safety Directorate (OISD) and measures are suggested in the amendments to the OISD standards for safety and oil companies need to show compliance over time.

Follow-up surveillance and rehabilitation mechanisms in the health service for exposed persons who may suffer long term disabilities are not yet well developed and focussed. This is an area of concern.

10.5 Assessment and Comments

The emergency preparedness aspect has improved over the last decade and there is a much greater level of awareness in the country. Some of the areas requiring attention include:

- The need for a centralised incident data base covering all sectors with a possibility of on line reporting;

- The requirement for a formal mechanism for identifying medical equipment, fire service requirements, police in areas of high chemical hazard and incorporation of these in the planning mechanism at the local level to ensure sufficient stocks in the hospitals. The stocking and selection must be done scientifically. Similarly, training of fire, police and medical response personnel must be further strengthened.

- Post - incident health surveillance and rehabilitation mechanisms must be taken up as focus areas, where necessary, and capability built up for the same over time.

This section provides an opportunity to make an assessment of the country's capacity in relation to chemical emergencies; an evaluation of the needs in relation to chemicals emergency response in comparison with the current situation and the facilities available through the existing disaster preparedness and management infrastructure: for example needs in relation to coordination mechanisms, communications, equipment, databases and information management systems, trained human resources, health service capacity for response, environmental services clean-up capacity, mechanisms for follow-up and rehabilitation of exposed persons. It may be that the capacity varies considerably from region to region, with good facilities in the vicinity of major towns and poor facilities in remoter regions.

CHAPTER 11

INTERNATIONAL LINKAGES

11.1 Cooperation and Involvement with International Organisations, Bodies and Agreements

India has active participation and memberships in various international organisations, programmes and bodies related to chemical safety. India is a founding member of UNIDO. It has been both a recipient and a contributor to the multi-faceted industrial assistance and cooperative programmes implemented at global, regional and sectoral levels. India is also a founder member of the International Labour Organisation, which came into existence in 1919. International programmes are briefly discussed below along with India's role.

Intergovernmental Forum on Chemical Safety (IFCS)

The concept of an inter-governmental forum to address chemical safety originated during preparations for the 1992 United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, when the UNCED PrepCom identified the collaborative efforts of UNEP, the International Labour Organisation (ILO) and the World Health Organisation (WHO), within the International Programme on Chemical Safety (IPCS), as the nucleus for international cooperation on the environmentally sound management of toxic chemicals. The PrepCom invited the IPCS to identify possible intergovernmental mechanisms for risk assessment and chemicals management. In response, UNEP, ILO and WHO convened an expert meeting in London, UK, in December 1991 to consider priority areas for an international strategy and proposals for an inter-governmental mechanism for the environmentally sound management of chemicals. The meeting resulted in a recommendation to establish an inter-governmental forum on chemical risk assessment and management that was forwarded to UNCED.

At UNCED, delegates adopted Agenda 21, a programme of action for sustainable development. Chapter 19 of Agenda 21 addresses the "Environmentally Sound Management of Toxic Chemicals Including Prevention of Illegal International Traffic in Toxic and Dangerous Products," and contains an international strategy for action on chemical safety. Chapter 19 also calls for the establishment of an Intergovernmental Forum on Chemical Safety (IFCS).

National focal point for IFCS in India is the Ministry of Environment & Forests, Government of India, and the Department of Chemicals, Ministry of Chemicals and Fertilisers is also involved. The related national activities, as identified under IFCS are:

- National Chemicals Management Profile;
- Poison Control;
- Capacity Building – Training and Research;
- Emergency Preparedness and Response;
- Information System; and
- Strategic Approach to International Chemical Management (SAICM)

Strategic Approach to International Chemical Management (SAICM)

At its seventh special session held in February 2002, the Governing Council of the United Nations Environment Programme (UNEP) adopted decision SS.VII/3, in which it decided that there was a need to further develop a strategic approach to international chemicals management (SAICM) and endorsed the IFCS Bahia Declaration and Priorities for Action Beyond 2000 as the foundation of that approach.

The decision requested UNEP to work in consultation and collaboration with Governments, participating organisations of the Inter-Organisational Programme for the Sound Management of Chemicals (IOMC), the IFCS, and other stakeholders. The SAICM initiative was endorsed by the World Summit on Sustainable Development in Johannesburg in September 2002.

A key feature of the SAICM process will be its engagement of all sectors of society with an interest in chemical safety, including environment, health, agriculture, labour, industry and development.

Policy co-ordination across sectors at both national and international levels will be important to ensure effective management of chemical risks. In this regard, the World Health Assembly (WHA) and the International Labour Conference (ILC) both formally expressed support for, and willingness to contribute to, the SAICM process.

UNEP – IE / PAC Cleaner Production Programme

The UNEP IE / PAC Cleaner Production Programme was launched in response to a decision from the UNEP Governing Council, on the need to reduce global industrial pollution and waste.

The objectives of the programme are to:

- ➲ Increase worldwide awareness of the cleaner production concept;
- ➲ Help governments and industry develop cleaner production programmes;
- ➲ Foster the adoption of cleaner production; and
- ➲ Facilitate the transfer of cleaner production technologies.

To meet these objectives, the programme focuses on the collection and dissemination of information on cleaner production that:

- ✓ Explains the concept;
- ✓ Illustrates technical applications; and
- ✓ Helps people develop cleaner production programmes

These efforts, initiated through a number of different activities, have cultivated an ever-expanding informal network of cleaner production experts, both in the public and private sectors.

The programme contains four major elements: Publications, Training and Technical Assistance, ICPIC and Working Groups

National focal point for IE / PAC is the National Productivity Council, New Delhi.

The International Programme on Chemical Safety (IPCS)

In 1972, the United Nations Conference on the Human Environment took place in Stockholm. This Conference recommended that programmes, to be guided by WHO, should be undertaken for the early warning and prevention of harmful effects of chemicals to which humans were being increasingly exposed, and for the assessment of the potential risks to human health. On this basis, a programme called the International Programme on Chemical Safety (IPCS) was developed and structured.

IPCS, established in 1980, is a joint programme of three Cooperating Organisations - ILO, UNEP and WHO, to implement activities related to chemical safety. WHO is the Executing Agency of the IPCS, whose main roles are to establish the scientific basis for safe use of chemicals, and to strengthen national capabilities and capacities for chemical safety.

The two main roles of the IPCS are to establish the scientific health and environmental risk assessment basis for safe use of chemicals (normative functions) and to strengthen national capabilities for chemical safety.

Ministry of Environment & Forests, Government of India is the national focal point for IPCS in India.

Table 76 gives details of India's membership in above programmes and various international organisations and bodies. Table lists national focal points, other ministries and agencies involved and related national activities.

Various international agreements / procedures exist related to various aspects of Chemicals Management. Some of the relevant agreements are discussed in **Table 77** along with the primary responsible agency and related national activities.

Globally Harmonised System of Classification and Labeling of Chemicals (GHS)

"Globally Harmonised System of Classification and Labeling of Chemicals (GHS)", addresses classification of chemicals by types of hazard and proposes harmonised hazard communication elements, including labels and safety data sheets. It aims at ensuring that information on physical hazards and toxicity from chemicals be available in order to enhance the protection of human health and the environment during the handling, transport and use of these chemicals.

The GHS also provides a basis for harmonisation of rules and regulations on chemicals at national, regional and worldwide level, an important factor also for trade facilitation.

The first edition of the GHS, which was intended to serve as the initial basis for the global implementation of the system, was approved by the Committee of Experts at its first session (11-13 December 2002) and published in 2003.

At its second session (10 December 2004), the Committee of Experts adopted a set of amendments to the GHS, and the first revised edition of the GHS takes account of all these amendments, which include various revised provisions concerning classification and labelling, new provisions for aspiration hazards and new guidance on the use of precautionary statements and pictograms and on the preparation of safety data sheets.

The Plan of Implementation of the World Summit on Sustainable Development (WSSD), adopted in Johannesburg in 2002, encourages countries to implement the GHS as soon as possible with a view to having the system fully operational by 2008.

11.2 Participation in Relevant Technical Assistance Projects

As can be seen from the above text, all major international as well as regional bodies are actively working in India on various projects, and a large number of these projects are directed to chemical management, environment and sustainable development, agricultural and industrial development etc. Since number of ongoing and planned projects is rather large, it is not practical to list them down here. However, list of such projects is available on internet on their respective websites for which the following websites may be referred:

- http://web.worldbank.org/external/projects/main?pagePK=217672&piPK=95916&theSitePK=40941&menuPK=223661&category=regcountries&regioncode=4&countrycode=IN

- http://www.adb.org/India/projects.asp

- http://www.unido.org/data/Country/Project.cfm?c=IND

11.3 Comments/Analysis

- Progress in terms of national implementation activities of international agreements is generally good and implementation is at various stages depending upon commitments. For example Basel Convention and Montreal protocol have been incorporated in the national laws and implemented with full degree of confidence.

- Most of the major international organisations are working actively in India, such as WHO, ILO, World Bank, UNIDO, FAO etc., and their work is well integrated into comprehensive national programmes.

- There is appropriate coordination on the national level with respect to implementation of international programme in the area of chemical management. National Focal Points are well defined and their duties are laid down. Implementation is at various stages, and in overall assessment, it can be rated good.

- There are well-defined procedures and structures to help ensure coordination between ministries/ agencies and those responsible for health and safety activities. Depending upon the scope of activities there is a designated ministry/agency to deal with international organisation. For example, Labour Ministry is responsible for all activities related to ILO or the Health Ministry for WHO work in India.

- The introduction of proper accreditation system of professionals and standardisation of the procedures, and data management by the international agencies can improve the effectiveness of their current programmes in India. The most specific recommendation in this regard shall be focussed on priorities and better adaptation to local conditions.

- The biggest obstacle in India, however, lies in the way of implementing international agreements to the flow of information and the management of the information.

Table 76: Membership in International Organisations, Programmes and Bodies

International Organisation / Body / Activity	National Focal Point (Ministry/Agency & Primary Contact Point)	Other Ministries/Agencies Involved	Related National Activities
Intergovernmental Forum on Chemical Safety (IFCS)	HSM Division, Ministry of Environment & Forests	Department of Chemical, Ministry of Chemical and Fertiliser	National Chemicals Management Profile Poison Control Capacity Building – training and research Emergency Preparedness and Response Information System Strategic Approach to International Chemical Management (SAICM)
UNEP-Industry and Environment Programme Activity Centre (IE/PAC) - Cleaner Production Centre	Ministry of Environment & Forests	National Productivity Council, New Delhi	Cleaner Production Centre set up at NPC Delhi
Food and Agriculture Organisation (FAO)	Ministry of Consumer Affairs, Food and Public Distribution	Ministry of Agriculture	FAO has continuously been a partner in India's development from a food deficit country to a net food exporting country. FAO concentrates on its technical assistance in a relatively small number of catalytic areas where high quality technical assistance can be effectively leveraged into a large quantum of ultimate development. FAO's current focus in India is mainly on plant production activities, forestry, fisheries, nutrition, and food quality & safety.
World Health Organisation (WHO)	Ministry of Health & Family Welfare	Ministry of Environment & Forests, Ministry of Urban Development	WHO provides technical cooperation, collaboration and coordination for health to the Government in support of national health development efforts
International Labour Organisation (ILO)	Ministry of Labour	-	India is a founder member of the International Labour Organisation, which came into existence in 1919. The principal means of action in the ILO is the setting up the International Labour Standards in the form of Conventions and Recommendations. India has so far ratified 39 Conventions of the ILO

International Organisation / Body / Activity	National Focal Point (Ministry/Agency & Primary Contact Point)	Other Ministries/Agencies Involved	Related National Activities
United Nations Industrial Development Organisation (UNIDO)	Ministry of Commerce and Industry	Ministry of Environment & Forests	India is a founding member of UNIDO. It has been both a recipient and a contributor to the multi-faceted industrial assistance and cooperative programmes implemented at global, regional and sectoral levels. Its main responsibility is to develop, coordinate and support the overall cooperation between UNIDO and the Government of India, the academic community, the private sector and civil society for promoting industrialisation. This includes the development of programmes for sustainable industrial development, resource mobilisation at the country level and collaboration with various development partners
World Bank	Ministry of Environment & Forests, Ministry of Urban Development, Ministry of Economic Affairs	In India, the Bank works with multiple development partners: The government, other bilateral and multilateral donor organisations, nongovernmental organisations (NGOs), the private sector, and the general public — including academics, scientists, economists, journalists, teachers and local people involved in development projects.	The World Bank has developed an action plan known as the India Country Assistance Strategy (CAS), which describes what kind of support, and how much could be provided to the country. The CAS directly supports the government's five-year plan and focuses on strengthening the enabling environment for development and sustainable growth and supporting critical interventions of special benefit to the poor and disadvantaged.

International Organisation / Body / Activity	National Focal Point (Ministry/Agency & Primary Contact Point)	Other Ministries/Agencies Involved	Related National Activities
Asian Development Bank	Ministry of Economic Affairs	Various ministries	ADB was established in 1966. India was one of its 31 founding members. ADB's principal tools are loans, guarantees, and technical assistance, which it mainly provides to government for specific projects and programs - infrastructure-led growth supported by social development and good governance, agriculture and rural development, infrastructure investments, transport sector operations, energy sector operations, power sector reforms, Urban sector projects, etc. Cumulative ADB lending to India as of 31 December 2004 was US$14.6 billion.

Table 77: Participation in International Agreements / Procedures related to Chemical Management

International Agreements	Primary Responsible Agency	Relevant National Implementation Activities
Agenda 21 - Commission for Sustainable Development	Ministry of External Affairs, Ministry of Environment & Forests	The Government of India has initiated the process of preparing a National Sustainable Development Strategy (NSDS). The draft strategy will go through an iterative process of political, technical and stakeholders' consultations. India is also of the view that the NSDS process should be a continuous process involving the three elements of planning, actions and feedback.
UNEP London Guidelines (Voluntary Procedure) 1	Ministry of Environment & Forests	
FAO Code of Conduct (Voluntary Procedure) 1	Ministry of Agriculture, Ministry of Environment & Forests	
The Rotterdam Convention - PIC Procedure for certain hazardous chemicals and pesticides in international trade	Ministry of Chemicals and Fertilisers, Ministry of Agriculture and Ministry of Environment & Forests	India has ratified Rotterdam Convention on PIC procedure
Montreal Protocol	Ministry of Environment & Forests	Ozone Cell in Ministry of Environment & Forests came into existence with effect from 01.04.1993. It deals with all works relating to the Vienna Convention for the Protection of Ozone Layer and the Montreal Protocol for phasing out Ozone Depleting Substances (ODS). The use of ODS is to be phased out by the year 2010 as per the schedule prescribed in the Protocol. Ozone Depleting Substances (Regulation & Control) Rules 2000 notified by Government of India.
ILO Convention 170	Ministry of Labour	The ILO instruments have provided guidelines and useful framework for the evolution of legislative and administrative measures for the protection and advancement of the interest of labour. To that extent the influence of ILO Conventions as a standard for reference for labour legislation and practices in India, rather than as a legally binding norm, has been significant. India has so far ratified 39 Conventions of the ILO, however, Chemical Convention 170 is not yet ratified.

International Agreements	Primary Responsible Agency	Relevant National Implementation Activities
Basel Convention	Ministry of Environment & Forests	India is a signatory to the Basel Convention, which requires countries to ensure that hazardous wastes and hazardous recyclable materials are managed in an environmentally sound manner. The Ministry participates in various meetings of the Basel Convention regularly. India is also actively involved in the work relating to preparation of technical guidelines for environmentally sound management of ship-breaking along with Norway and the Netherlands under this convention. Hazardous Waste Management and Handling Rules have been notified in 1989 and further amended in 2000 and 2003 and is in line with the requirement of Basel Convention.
London Convention (Stockholm Dumping Guidelines)	Ministry of Shipping, Road Transport and Highways, Ministry of Environment & Forests	India is not a signatory to London Convention 1972 on Prevention of Marine Pollution by Dumping of Wastes and Other Matter
Chemical Weapon Convention	Cabinet Secretariat	The Chemical Weapons Convention (CWC) bans the development, production, acquisition, stockpiling, retention, and direct or indirect transfer of Chemical Weapons. It also prohibits the use or preparation for use of CW and the assistance, encouragement, or inducement of anyone else to engage in activities prohibited by the CWC. India has ratified the convention in 1996 and has enacted Chemical Weapon Convention Act in 2000 and notified Chemical Weapon Convention Appeal Rules in 2005
Stockholm Convention on POPs	Ministry of Environment & Forests	India has signed the Stockholm Convention on POPs in May 2002. The Convention seeks to eliminate production, use, import & export of 12 identified POPs namely Adrin, Endrin, Dieldrin, Chlordane, DDT, Heptachlor, Toxaphene, Mirex, Hexachlorobenzene, Polychlorinated Biphenyls, Dioxins and Furans. An Enabling Activity project on Development of a National Implementation Plan (NIP) as a first step to Implement the Stockholm convention on Persistent Organic Pollutants is now underway.
Bilateral Agreements	Indo-GTZ Project, Ministry of Environment & Forests	Hazardous Waste Management

CHAPTER 12

AWARENESS / UNDERSTANDING OF WORKERS AND THE PUBLIC

12.1 Introduction

A list of legal instruments, programmes, policies and related activities designed to provide training and awareness to workers and the public is given below:

12.2 Mandatory Provisions

There are several legal provisions mandating that workers be suitably trained for handling chemicals. A brief is given in **Table 71 -73**.

Table 70: Information to Workers on Health and Safety

Agency	Legal Instruments	Programmes
Occupier of the industry	The Factories Act	Training workshops/ seminars/ on-the-job training
Occupier of the industry	MSIHC Rules under the E(P) Act	Training workshops/ seminars
	Sector-specific Acts (Insecticides Act, Petroleum Acts, Explosives Act, Dock Workers Act etc.)	Training workshops/ seminars
	CA(EPPR) Rules- Through DCGs and LCGs.	Training workshops/ seminars
Chief Inspector of Factories under Ministry of Labour	Factories Act	Training workshops/ seminars
National Safety Council	Factories Act	Training workshops/ seminars. Focus on chemical safety issues, hazardous materials handling, unsafe acts and conditions etc.
	MSIHC Rules under the E(P) Act	Training workshops/ seminars
Ministry of Environment and Forests (through training institutes)	MSIHC Rules under the E (P) Act	Training workshops/ seminars-3-tier training programmes, top, middle and supervisory cadres through various Training Institutes/ NSC/ FICCI/ ASSOCHAM and others)
Central Pollution Control Board (CPCB)	Air Act, Water Act, Hazardous Waste Management & Handling Rules, acute and chronic toxicity	Training workshops/ seminars-conducted through SPCBs or Regional Offices of CPCB
Ministry of Shipping, Road Transport and Highways	Central Motor Vehicles Rules	Funding of training conducted by recognised institutes and NGOs- approved programmes
Industry Organisations (CII, ICC etc.)	MSIHC Rules (under the E(P) Act)	Training workshops/ seminars. sponsored by MoEF or Industry Associations

Table 71: Information to the Public on Health and Safety

Agency	Legal Instruments	Programmes
Occupier of the industry	The Factories Act	On-the-job training and specific training on chemical handling etc.
Occupier of the industry	MSIHC Rules under the E(P) Act	Information on the chemicals, hazards, use of PPEs, emergency response etc.
Local/ District Crisis Groups	CA (EPPR) Rules- through DCGs and LCGs.	Training workshops/ seminars
Disaster Management Agencies (state level)	State Disaster Management Act (notified in some States e.g. Gujarat, Orissa etc)	Training workshops/ seminars
Ministry of Shipping, Road Transport and Highways	Central Motor Vehicles Rules	Funding of approved training conducted by recognised institutes and NGOs
Multilateral organisations such as World Bank, Asian Development Bank, UNEP etc.	Institutions have their own internal guidelines	Environmental & social assessment and inclusion of environment, public health & safety and poverty alleviation

Table 73: Awareness Building and Public Education

Agency	Legal Instruments	Programmes
Ministry of Environment And Forests	E (P) Act	Programmes / workshops / school level education on environment etc.
CPCB / SPCB	E (P) Act, Air Act, Water Act, HW (M&H) Rules	Training workshops / seminars. some campaigns in schools, posters etc.
Local/ District/ State/ Central Crisis Groups	CA (EPPR) Rules	Training workshops / seminars
Disaster Management Agencies (state level)	State Disaster Management Act (notified in some states e.g. Gujarat, Orissa etc)	Training workshops / seminars
Multilateral Organisations such as World Bank, Asian Development Bank, UNEP etc.	Internal Guidelines	Training workshops / seminars

Under the Factories Act, training of workers is mandatory. Other sector specific Acts or Rules, such as the Explosives Act for Explosives, the Petroleum Act for Petroleum products, the Insecticide Act for insecticides, The Dock Workers (Safety, Health, Welfare Act for Docks and other Acts and Rules mentioned in Table 55, also make it mandatory for workers handling the hazardous substances / materials / processes to be suitably trained. The

MSIHC Rules also make it mandatory for Occupiers to impart training to workers.

The Factories Act and the MSIHC Rules also make it mandatory for the Occupier to inform the nearby affected community about possible hazards from the site and also inform the District collector of any possible Offsite emergency scenarios arising out of an incident at the factory. In addition, the Local and District Crisis Groups (constituted under the CAEPPR notified under the EP Act) also have a mandate to educate the nearby community about possible hazards and precautions, remedial actions etc.

The Environment (Protection) Act and subsequent EIA notifications also make it mandatory to conduct a public hearing for specific categories of projects that are likely to have an important environmental impact. During this hearing, members of the public are free to ask the project proponents any question on the proposed project, the chemicals being handled, their safety or environmental damage potential etc.

For transportation, the Central Motor Vehicle Rules (CMVR) make it mandatory for the driver to be trained in the handling of chemicals being transported along with many other issues. Certified training form a recognised institute is mandatory for the license endorsement for carrying hazardous materials. Training of drivers carrying hazardous goods from Institutes recognised by the Ministry of Shipping, Road Transport and Highways is mandatory under the CMVR. A special two day course is mandatory for driver license endorsement (for hazardous goods transportation) - the subjects covered include general safety, cargo safety issues, driving issues, parking, emergency management and other aspects. Under the CMVR, it is also necessary for Consigners to provide training to drivers on important cargo safety provisions, handling and loading and unloading (Consignee end) issues.

Apart from mandatory training under the above laws, various Ministries are actively involved in training initiatives. Programmes and projects being undertaken by various Ministries involved in Chemicals management are given in Chapter 5 and budget allocations for chemicals management under different heads is described in Chapter 12. Some of the important training initiatives are described below (not exhaustive):

12.3 Training by Various Ministries

The major Institutes / bodies involved in the training of workers and members of the public include:

- The Ministry of Environment & Forests, which sponsors a 3 - tier (Senior Management, Middle Management and Supervisory Cadres) safety training programme. The programme is conducted by approved institutes / Industry Organisations / National Safety Councils and other organisations in various parts of the country. The programme is

focussed towards chemical safety, and covers many aspects, such as legislation, transport safety, hazardous materials safety, fire issues, unsafe acts and conditions and many other safety issues. Participants include personnel from all sectors of industry, though the focus and main participation is from the chemical and allied industry.

- The National Safety Council (under the Ministry of Labour, Factories Department) conducts safety and awareness programmes on a host of topics of relevance to chemicals management, some sponsored by the Ministry of Environment and Forests and some by the National Safety Council organisation or local “Action Centre” or “Chapters” of the council. These programs try and reach out to a large section of workers typically and some programmes are focused towards the “Occupiers”. Topics typically include safety legislation, child labour, fire safety, accidents and accident investigation, process safety and many others.

- The Central Pollution Control Board (CPCB) conducts training programmes of environment awareness, Air Act, Water Act, Hazardous Waste Management and other topics. The programmes have wide participation from Industry and members of the public. These programmes are conducted either by the CPCB headquarters (Delhi) or by the CPCB regional offices.

- The Ministry of Shipping, Road Transport and Highways also allocates funds for Institutes carrying out road safety awareness programs and also recognised road safety training Institutes for training drivers.

- The Ministry of Chemicals and Fertilisers encourages training of its officers and its organisations such as the FAI (Fertiliser Association of India) conduct training programmes for fertiliser plant workers and farmer co-operatives.

- The Ministry of Agriculture conducts programmes for agriculture workers at its various Institutes and has programmes specifically targeted at agricultural programmes being undertaken by the Government of India.

Apart from the above, many other bodies such as the ICC, FICCI, CII and others also conduct training programmes on chemicals management, safety issues, environment issues and related topics (described in Chapter 6).

Training aspects are well integrated with programmes and initiatives related to chemicals management. However, training programmes need to be more focussed towards profession building in addition to awareness only.

CHAPTER 13

RESOURCES AVAILABLE AND NEEDED FOR CHEMICALS MANAGEMENT

13.1 General

Due to the cross-sectoral nature of chemical management, several ministries, agencies and institutions are involved. Information have been gathered on the professional, technical and financial resources available within these ministries, agencies and institutions to assess the extent of such resources available and also assess the resource needs for effective management of chemicals.

13.2 Resources Available and Needed in Government Ministries/Institutions

The purpose of Table 13 is to provide an overview of resource availability and resource needs within the national government. Table 13 addresses the existing resources available within government ministries, agencies and other institutions specifically to address management of chemicals.

13.3 Comments/Diagnosis

It is evident from **Table 74** that the Government of India has allocated significant resources in the field of chemicals management. The budget allocations include support to programmes, research institutions, secretarial, educational and other heads. The type of expertise available with the Ministries, as mentioned in Table 74, includes technical, scientific, policy and administrative functions. All ministries concerned have necessary manpower to address chemicals management in terms of manpower. All the Ministries have a technical and scientific cadre, recruited through a highly competitive system on an “All India basis - the technical and scientific cadre are also involved in administration to varying extents.

The Government has some mechanisms in place to ensure that technical and scientific staff is given appropriate work training and proper exposure, both at national and international level, in their respective fields of work. However, proper identification of training needs and methods, particularly latest state - of - the - art training methods, is an area that needs attention. Training of officers at times remains limited to attending conferences, seminars, inter governmental meetings etc. - these need to be strengthened by a proper training needs identification, delivery and appraisal mechanism.

There is no shortage of skilled and trained technical manpower in the Government departments handling chemicals. The need for outsourcing services has been discussed in earlier sections and this area needs to be addressed. This could strengthen the Government and allow it to focus more on areas of strategy, programme initiation, development and implementation rather than ones easily outsourced with little value addition.

Table 74: Resources Available In Government Ministries / Institutions

S. No.	Ministry	Department	Head	Type of Expertise Available	Budget Allocation (Rs. In crores for 2005-06)
1	Ministry of Agriculture	Department of Agriculture and Cooperation	Secretariat - Economic Services	Technical, Scientific, Policy and Administrative	37.92
			Plant Protection		52.92
			Implementation of Insecticides Act		8.28
			Education & Training		67.50
2	Ministry of Chemicals and Fertilizers	Department of Chemicals & Petrochemicals	Secretariat - Economic Services	Technical, Scientific, Policy and Administrative	7.19
			Institute of Pesticides Formulation Technology		3.33
			National Institute of Pharmaceutical Education & Research		12.00
			Chemical Weapon Convention		0.08
			Pharmaceutical Research and Development Program		0.25
			Chemicals Promotion and Development Scheme		1.00
		Department of Fertilizers	Secretariat - Economic Services		6.43
3	Ministry of Commerce and Industries	Department of Industrial Policy and Promotion	Secretariat - Economic Services	Technical, Scientific, Policy and Administrative	20.75
			National Productivity Council		7.40
			Explosives Organization		13.50
			Environmental Education Training Scheme		32.52
			Environmental Information System		4.69
			Centers for Excellence		8.89
			Prevention & Control of Water Pollution		76.52

S. No.	Ministry	Department	Head	Type of Expertise Available	Budget Allocation (Rs. In crores for 2005-06)
			Establishment of Environmental Authorities, Environmental Commissions & Tribunals		4.00
			Central Pollution Control Board		46.57
			Promotion of Common Effluent Treatment Plants		4.40
			Other Schemes for Prevention and Control of Pollution		1.00
4	Ministry of Environment and Forests		Development & Promotion of Clean Technology		0.50
			Abatement of Pollution		4.00
			Hazardous Substance Management		6.00
			Indo-Canada Environment Facility Project		0.01
			GOI - UNDP Environment Support Program		4.00
5	Ministry of Finance	Department of Revenue	Secretariat - General Services	Technical, Scientific, Policy and Administrative	48.72
			Narcotics Control		11.95
		Indirect Taxes	National Academy of Customs, Excise and Narcotics		9.93
6	Ministry of Health & Family Welfare	Department of Health	Secretariat - Social Services	Technical, Scientific, Policy and Administrative	19.30
			Prevention of Food Adulteration		60.45
7	Ministry of Home Affairs	Ministry of Home Affairs	Secretariat - General Services	Technical, Scientific, Policy and Administrative	71.86
			Narcotics Control Bureau		15.59
			Civil Defense		213.38
			Disaster Management Grant-in-aid		0.05

S. No.	Ministry	Department	Head	Type of Expertise Available	Budget Allocation (Rs. In crores for 2005-06)
8	Ministry of Labour	Ministry of Labour	Secretariat - Social Services	Technical, Scientific, Policy and Administrative	16.34
			Working Conditions & Safety		33.02
			National Labour Institute		4.70
9	Ministry of Petroleum and Natural Gas	Ministry of Petroleum & Natural Gas	Secretariat - Economic Services	Technical, Scientific, Policy and Administrative	10.03
10	Ministry of Science & Technology	Department of Science & Technology (DST)	Secretariat - Economic Services	Technical, Scientific, Policy and Administrative	23.75
			Technology Information, Forecasting and Assessment Council (TIFAC)		23.75
			National Accreditation Board for Laboratories (NABL)		5.00
		Department of Scientific & Industrial Research	Secretariat - Economic Services		4.90
			CSIR National Laboratories		1054.43
11	Ministry of Shipping, Road Transport and Highways	Department of Road Transport and Highways	Secretariat - Economic Services	Technical, Scientific, Policy and Administrative	24.76

CHAPTER 14

CONCLUSIONS AND RECOMMENDATIONS

14.1 Conclusions

For a complex and large country, as India, and in the timeframe available, it has not been possible in a first National Profile to establish a comprehensive assessment of chemical risks as they occur throughout the country; and in depth assessment may need to take place in stages as the necessary evidence base is developed. For this first version of the Profile a choice has been made of ten major chemical sectors to be studied in depth and already a number of conclusions arise from the analysis of the situation. An analysis on the basis of the ten sectors enabled a fairly good identification of the key hot spots for potential health and environmental impact from production, use and transport of the chemicals concerned. The industrial sectors involved have cooperated well in providing data and there is now an improved information base for decision making about sound management of chemicals. This information base needs to be built upon, improved, and expanded ensuring that data are collected on a regular basis using compatible formats and harmonised definitions, so that they can be used effectively for improved decision making in each sector and area of responsibility. Gaps in information are evident and various means to fill these gaps need to be explored.

The legislative infrastructure for ensuring sound management of chemicals in India appears overall to be largely adequate, whereas implementation and enforcement is only fair in many cases, due to a number of factors, not the least to poor public awareness and to lack of adequate inspection capacity. Neither is going to be resolved quickly. Civil society, in cooperation with government and the private sector, including the communications media, have a crucial role to play in improving public awareness and educating various users of chemicals in the society.

On the whole the technical infrastructure exists in India for sound management of chemicals and, although time did not permit for this version of the document to undertake extensive surveys of facilities and their adequacy, it has been possible to identify areas which need strengthening, particularly laboratory accreditation, availability of reference materials, capacity for recycling and safe disposal of obsolete chemicals, safe storage, handling and transport of chemicals and emergency response capabilities outside the main urban areas.

Awareness concerning chemical safety matters remains weak both among the public in general and many decision makers; but there exist educational programmes related to chemicals management.

Coordination and consultation in a large, diverse country like India with jurisdictional responsibilities divided among Federal, State, City and local authorities, always pose problems, and there is need for a permanent

consultative mechanism to be established to promote sound management of chemicals throughout the country.

Among the areas of concern and issues relating to sound management of chemicals in India identified in this first version of the National Profile attention is called to those listed below.

While in principle access to international databases is sufficient, as everything is available in the public domain on internet, the availability of national data is variable and analysis of the data and its harmonisation need improvement. In relation to data collection, particularly:

a) There is a need for harmonised definitions even within sectors e.g. dyes and intermediates, as well as standardisation of data reporting in tonnage or volume terms.

b) There are large differences between installed capacity and production of chemicals in some sectors, which need to be resolved.

c) While a beginning has been made (such as on labelling, side effects, and composition of products), overall data on consumer chemicals need strengthening.

d) Methodology needs to be developed for including accurate data on raw materials and intermediates.

e) The time lag for data collection needs to be reduced.

f) While hazardous waste production data are well documented, those on importation need greater coordination.

g) There is the need for tracking of certain key chemicals, e.g. mercury.

There is a general lack of health related data, either in relation to public health or the workplace. One third of work related deaths are due to chemicals. Exposure data, where very little exists, and location sensitivity is not well understood; needs attention for all categories. The use of available data for local risk assessment and other related activities still has limitations. A network of Poisons Information Centres is needed to cover the whole country, with systematic collection of harmonised data on toxic exposures.

While the legislative infrastructure is adequate, a number of areas need attention, particularly: the more effective implementation of laws, including improved inspection, identification of overlaps or gaps, and how to make non-regulatory instruments more effective. Implementation could be improved through sound management procedures, including:

a) Chemicals Registration Systems (apart from pesticides where it is effective);

b) Storage of chemicals; transport of chemicals; handling of containers and incompatibilities among and between chemicals in each of these areas;

c) Management of obsolete and expired chemicals, and impounded chemicals;

d) Improved Interstate transport of hazardous chemicals; and

e) Implementation of the GHS.

Technical infrastructure exists but it needs either to be strengthened or made more widely available. A detailed survey in each area of technical infrastructure needs to be undertaken in order to better quantify the situation for improved chemicals management.

a) In relation to laboratory infrastructure:

   Intra- and Inter-Laboratory Quality Assurance (QA) programmes are necessary to ensure precision and quality in the analyses undertaken. Laboratories should be advised to go for NABL and other international accreditation for maintaining the recognition. Reproducibility of results, error margins, accuracy and other precision topics need to be addressed.

   Standard Reference chemicals are high cost materials and their availability is insufficient in India. Mechanisms to ensure their availability and affordability need to be put into place. Certified Reference Material (CRM) development needs to be encouraged. There is a need to strengthen the Laboratory Accreditation system under different legislation.

b) In relation to waste disposal infrastructure:

   Only three States have toxic substance disposal facilities. However, problems of handling complex chemical wastes persist.

c) In relation to infrastructure for chemical emergencies, resource allocation needs to be improved.

Public awareness in relation to chemical safety matters is very weak, although educational programmes are available:

a) Information to the decision makers and the public at large concerning chemical needs attention for all categories.

b) Environmental and chemicals management education is available across the country. However, additional modules on quality and precision control techniques need to be introduced for laboratory chemists, technicians and other support services.

Access to information needs to be improved in relation to resources available and for chemicals management; including the number of professional staff available, the number/type of professional staff needed, and the training requirements

14.2 Recommendations

1. In order to promote sound management of chemicals throughout India and oversee the implementations of these recommendations, as may be appropriate, taking into consideration existing inter-ministerial coordinating activities, a permanent mechanism for coordination and cooperation should be established with a legal entity, including terms of reference and an assigned secretariat. Appropriate levels of government and concerned non-governmental organisation should be represented and procedures for broad consultation among stakeholders encouraged.

2. In order to ensure a regularly updated situation analysis for sound management of chemicals in India, the National Profile should be established on an going programme bases (under the auspices of the MoEF and CPCB), expanding to all chemical sectors and covering the whole chemicals life cycle, including raw materials, and adding other areas of infrastructure (particularly waste handling and recycling, chemical emergency response, ports handling, transportation and storage, and inter-state traffic). Subsequently, consideration may be given to the development of more detailed Regional or even State level Profiles on infrastructure for sound management of chemicals.

3. In order to encourage the development of an improved information base for decision making about sound management of chemicals in all sectors and by all relevant stakeholders, the data collection process should be institutionalised, broadening it to cover all sectors of chemicals production and use, including raw materials, and establishing harmonised data collection formats with standardized terminology and mechanisms for improved data reliability. This calls for an Institution to host and finance the data collection.

4. In order to provide a tool for information exchange and consultation concerning the National Profile, and to promote the availability of information on chemicals and chemicals related issues in India, the Website referred to above should be maintained and expanded. This calls for an Institution with adequate human resources and budget, which can even be out - sourced.

5. In order to improve legal compliance, monitoring and inspection, a professional inspection system should be created, with strict criteria for quality assurance and auditing under a national standards body and an accreditation scheme, such as an ISO standard, including the development of appropriate training. A responsible Institution should be designated for this purpose.

6. In order to strengthen the analytical capacity in relation to sound management of chemicals, legally required laboratory accreditation and operation schemes should be promoted, and appropriate Certified Reference Materials (CRM) developed and made widely available.

7. In order to promote an improved understanding of chemical safety matters, all sectors of society should be encouraged to cooperate in developing further public and worker awareness and professional training activities for sound management of chemicals.

8. In order to ensure that timely action is taken to implement these recommendations and that the relevant institutions incorporate the necessary budget appropriations in the forthcoming financial budget periods, it is proposed that CPCB and MoEF convene an early consultation of all interested stakeholders to draw up work plans and timetables and assign responsibilities for each proposed action.

9. In order to make the experience of India in developing its National Profile widely available internationally, it is proposed that India makes the approved Profile available to UNITAR for inclusion on the National Profile Website and also the INFOCAP website.