

Environment (Protection) Act of 1986—Umbrella Legislation for Environmental Protection

In the post-independence era, rapid industrialization and the growth of high-polluting industries posed a great challenge to India's environment and natural resources. There was substantive decline in environmental quality due to increasing pollution, loss of green cover, damage to biological diversity, and excessive concentration of harmful chemicals and effluents in the ambient air, water bodies, and soil. Though laws existed that dealt directly or indirectly with several environmental matters, including forests, wildlife, water, and air, many of these laws dated back to the British era and were not adequate to deal with new and emerging challenges. There was a need for general yet comprehensive legislation on the environment that could address the multiple challenges of existing environmental issues and future environmental threats while balancing the development needs of the country.

The turning point in India's environmental policy and regulatory regime came with the introduction of the Environment (Protection) Act of 1986 (EPA). The EPA was enacted to give effect to the decisions taken at the United Nations Conference on the Human Environment held in 1972. The EPA provided a much-needed umbrella framework for environmental protection and improvement through regulation of developmental activities. The EPA not only ushered in clarity and precision in the government's approach toward development from the perspective of environmental protection, but was also instrumental in identifying the environmental hazards not addressed under a regulatory framework. The EPA also aimed at providing control mechanisms to guard against slow, insidious buildup of hazardous substances, especially new chemicals, in the environment. The idea was not to discourage industry, but to encourage "environment-friendly" development.

The EPA lays down a very broad regulatory framework on all aspects of the environment including water, air, land, and the interrelationship that exists among water, air, land, human beings, other living creatures, plants, micro-organisms, and property. It seeks to centralize

the powers relating to formulation of nationwide environmental planning, policymaking, and coordination of actions taken by various state governments with the central government through its Ministry of Environment & Forests (MoEF). The Act enables the MoEF to lay down standards for environmental quality; emissions or discharges of environmental pollutants from various sources; procedures for handling materials; rules for locating industry; compulsory reporting of environment pollution by industry; and recovery of costs of cleanup from the polluter. The EPA provides a mechanism for establishing environmental laboratories, taking samples of air, water, soil, or any other substance from an industrial establishment, analysis of such samples, and initiation of penal action against erring industries (see Box 1, page 3).

While laying down the broad principles for environment protection, the EPA offers much-needed flexibility to the legislature as well as policymakers to devise means and measures to address emerging environmental issues and concerns. The EPA has enabled the government to develop and further strengthen the regulatory regime on critical environmental hazards, to introduce innovative mechanisms for balancing environmental and developmental needs, and to delegate specific responsibilities to specific organs of the government. These have been given effect in the form of rules, notifications, and circulars.¹ Some of the measures that have been adopted under the auspices of the umbrella framework offered by the EPA include standards for discharge of environmental pollutants, land use regulation, waste management, chemicals management, environment impact assessment, and regulation of developmental activities in coastal zones.

1. "Rules" are bylaws, regulations, and procedures formulated by an authority in exercise of the powers conferred by a statute upon such authority in order to carry out the purposes of the statute. "Notification" implies informing people of any new law, rule, regulation, or decision by way of publication in the official gazette. Any new law, rule, or regulation, unless otherwise specified, comes into effect from the date of its publication in the official gazette. "Circular" refers to a directive or a notice issued by an administrative authority for a limited purpose, in the exercise of its powers. Circulars are generally not required to be notified in the official gazette.

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Box 1: Procedure for Collection of Samples of Air, Water, Soil, or Other Substances Under the EPA

The powers relating to taking samples of air, water, soil, or other substances under the EPA have been delegated to the State Pollution Control Board (SPCB)* or Pollution Control Committee (PCC).** Further provisions regarding collection of samples and analysis have been laid down under the Water (Prevention and Control of Pollution) Act of 1974 (Water Act) and Air (Prevention and Control of Pollution) Act of 1981 (Air Act) with respect to samples of trade effluents and ambient air, respectively.

The result of an analysis of a sample is not admissible in evidence in any legal proceeding unless the relevant authority complies with the procedure for taking samples as enumerated under the EPA/Water Act/Air Act. The procedure is as follows:

1. When a sample of sewage/trade effluent/ambient air is to be taken from a plant for the purpose of analysis, the representative of the SPCB / PCC taking the sample must inform the person in charge of the plant (or his agent) of his intention through a written notice.
2. The sample should be collected in the presence of the person in charge or his agent.
3. After the sample has been taken, the same is required to be clearly marked and sealed and be signed by the person in charge as well as the representative of the SPCB / PCC.
4. The sample collected should be sent to a laboratory recognized by the SPCB.
5. Under the Water Act, the sample collected is required to be divided into two parts and each part should be placed in a container. One of the containers must be sent to the laboratory established or recognized by the SPCB. At the request of the person in charge of the plant, the other sample should be sent to a laboratory established or recognized by the state government under the Water Act. If no request for division of the sample is made by the person in charge of the plant, then the whole content shall be sent to the laboratory recognized or established by the SPCB.
6. In the event there is an inconsistency between the results of the analysis conducted by the laboratory established or recognized by the SPCB and the laboratory established by state government, the results of the latter shall prevail.

* The State Pollution Control Boards have been established in every state under the Water (Prevention and Control of Pollution) Act of 1974 and have also been vested with powers and functions under the Air (Prevention and Control of Pollution) Act of 1981. The SPCBs deal with matters relating to pollution, environment protection, hazardous waste, and chemical management in the respective states and various supervisory and management functions of the central government under the EPA have also been delegated to SPCBs.

** In Union Territories of India, PCCs have been established in place of SPCBs.

Standards for Discharge of Environmental Pollutants

The EPA empowers the MoEF to lay down standards for emission or discharge of environmental pollutants from various industries and operations. Standards for almost 100 different industries have already been laid down under the Environment Protection Rules of 1986 formulated under the EPA. Further, the Central Pollution Control Board (CPCB),² SPCB, and PCC have been empowered to lay down emission and effluent standards more stringent than the ones prescribed under these Rules. Needless to say, compliance with these standards is essential, and industries that fail to comply face stringent penalties and prosecution under the EPA, including suspension or closure of operations.

Land Use Regulation

An important aspect of environment protection is to identify areas that are ecologically fragile and devise

2.. CPCB is a statutory organization constituted in September 1974 under the Water Act. CPCB was further entrusted with the powers and functions under the Air Act. It serves as a field representative and also provides technical services to the MoEF. Principal functions of CPCB include control and abatement of air and water pollution.

measures for regulating indiscriminate developmental activities in such areas. Under Section 3(2)(v) of the EPA, the central government is empowered to identify and specify areas in which industries, operations, or processes can be prohibited or restricted. For example, in 1989 the Doon Valley was declared an “ecologically fragile area” by way of a notification, and various industrial and commercial activities, including mining, establishment of industries, grazing, tourism, etc., in this area were either restricted or prohibited. A similar notification for prohibiting industries in Murud-Janjira, Raigadh District, Maharashtra, was issued in the same year. Thereafter, a number of such notifications followed and accorded special protection to several ecologically sensitive areas in various parts of the country, including areas situated in and around national parks, sanctuaries, coastal areas, and forests. It is interesting to note that areas having historical significance have also been given protection under the EPA. For instance, the area surrounding Taj Mahal in Agra was declared as Taj Trapezium Zone and a Taj Trapezium Zone Pollution (Prevention and Control) Authority was constituted, *inter alia*, to monitor progress of the

implementation of various schemes for protection of the Taj Mahal from pollution and for taking all necessary steps to ensure compliance with specified emission standards.

Coastal Regulation Zone Notification

Until 1991, there was no specific law or regulation for protection and conservation of coastal habitat in India. In 1991, the MoEF issued the Coastal Regulation Zone (CRZ) Notification under the EPA for declaration of coastal stretches as Coastal Regulation Zone and for imposing restrictions/prohibitions on the setting up and expansion of industries, operations, and processes in CRZ. The coastal stretches of seas, bays, estuaries, creeks, rivers, and backwaters that are influenced by tidal action (in the landward side) up to 500 meters from the High Tide Line (HTL) and the land between the Low Tide Line (LTL) and the HTL have been declared the CRZ.

Importantly, the CRZ Notification does not impose an all-pervasive ban on activities along the coast. It only seeks to regulate perilous and high-polluting industrial activities in ecologically fragile coastal stretches. The CRZ Notification regulates a variety of human activities, such as industrial activities, manufacture, handling, storage, or disposal of hazardous substances, fish processing units, dumping of city or town waste for the purposes of landfilling, etc.

CRZ is divided into four categories, depending on its geomorphology and existing features of settlement (see Box 2). The regulations/restrictions on industries vary from one CRZ category to the other. A National Coastal Zone Management Authority at the central level and state coastal zone management authorities in the states have been established under the CRZ Notification.

Environmental Impact Assessment (EIA)

An important aspect of environment and land use planning is to identify, evaluate, and assess social and environmental impacts of any proposed development or industrial activity. In India, the concept of EIA came into existence around 1978. However, it was restricted to river valley projects. It was only in 1994 that EIA was formalized by issuance of a notification under the EPA. This notification mandated obtaining environmental clearance for setting up new projects relating to specified industries or processes or for expansion or modernization of such processes or operations.

In 2006 the MoEF issued a fresh notification on EIA. The notification lists certain projects or processes, such as mining of minerals, river valley projects, thermal power plants, cement plants, airports, building and

Box 2: CRZ Categories and Regulations

CRZ I is the highest protected category. This categorization is based on the extent of development in the area. It includes ecologically sensitive areas such as national parks and marine parks, sanctuaries, reserve forests, wildlife habitats, mangroves, and corals and coral reefs. Almost all construction activities are prohibited except projects relating to Department of Atomic Energy, and pipelines and conveying systems, including transmission lines and facilities that are essential for activities permissible under CRZ-I.

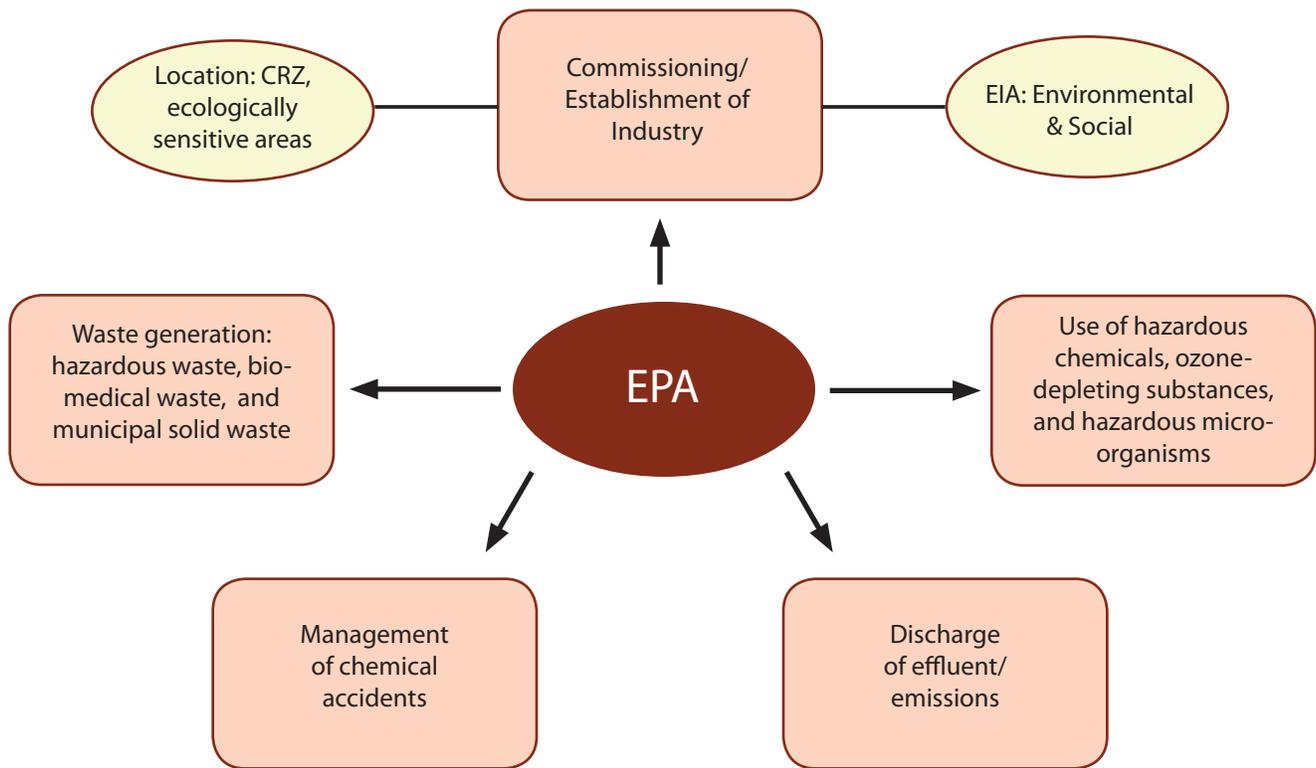
CRZ II includes areas that have already been developed up to or close to the shoreline. Most construction activities in the CRZ II category are highly regulated.

CRZ III comprises areas that are relatively undisturbed and includes coastal zone in the rural areas (developed and undeveloped) as well as within municipal limits or in other legally designated urban areas that are not substantially built up. No construction is permitted within the area up to 200 meters from the HTL, which is earmarked as a "No Development Zone." However, uses such as agriculture, horticulture, gardens, pastures, parks, play fields, forestry, and salt manufacture from sea water are permitted within this zone. The vacant plots between 200 and 500 meters of HTL in designated areas of CRZ-III can be used for construction of hotels and beach resorts for temporary occupation of tourists and visitors subject to the conditions in the CRZ Notification and with prior approval of the MoEF. CRZ IV consists of the coastal stretches in the Andaman & Nicobar, Lakshadweep, and small islands, other than those designated as CRZ-I, CRZ-II, or CRZ-III.

construction projects, special economic zones, etc., that require prior environmental clearance, both for setting up a new project and for expansion or modernization of an existing project. The notification provides for a detailed procedure for obtaining environmental clearance, which includes screening, scoping, public consultation, and

Box 3: EIA Notification

Under the EIA notification, all projects and activities are broadly categorized into two categories--Category A and Category B--based on the spatial extent of potential impacts and potential impacts on human health and natural and manmade resources. All projects included under Category A, including expansion and modernization of existing projects or activities and change in product mix, require prior environmental clearance from MoEF, which grants such clearance on the recommendations of an Expert Appraisal Committee. Similarly, the projects or activities covered under Category B require prior environmental clearance from the State/Union Environment Impact Assessment Authority (SEIAA). The SEIAA bases its decision on the recommendations of a State or Union level Expert Appraisal Committee.



appraisal. The notification also elaborates the post-clearance monitoring process.

Waste Management

In any country, generation of waste, namely industrial, hazardous, toxic, human, or household, is inevitable. The management of such waste is critical. India's waste management regime is governed by various rules framed under the EPA. The government of India has enacted separate rules for hazardous waste, bio-medical waste, and municipal solid waste. These rules cover an array of stakeholders, such as industries, hospitals and health-care facilities, municipal bodies, regulatory bodies, and households.

These rules are essentially based on a permit regime. For example, under the Hazardous Waste (Management, Handling, and Transboundary Movement) Rules of 2008, activities involving handling of hazardous waste, including generation, treatment, disposal, storage, import, export, recycling, reuse, etc., require prior approval of the concerned SPCB or the PCC. Similarly, under the Bio-Medical Waste (Management & Handling) Rules of 1998, clinics, dispensaries, and health-care institutions that provide treatment to more than 1,000 patients per month require an authorization from the SPCB or the PCC for generation, collection, storage, handling, treatment, and disposal of bio-medical waste.

Though the aforesaid rules provide for stringent monitoring and regulation by the regulatory authorities of industrial and commercial activities generating waste streams, they lack a holistic approach toward waste management. The current waste management regime fails to provide an impetus for "self-regulation" measures. The necessary emphasis or incentive to adopt cleaner technologies and production processes by the industry is also missing. Waste disposal, recycling, and treatment, which is still handled by the informal and unorganized sector, is increasingly becoming unmanageable and a great concern.

Chemical Management

The EPA empowers the central government to regulate hazardous substances. The MoEF has used the provisions of the EPA for framing regulations for handling of hazardous chemicals, hazardous micro-organisms, genetically engineered organisms, and ozone-depleting substances, and to address issues concerning health and safety.

The Manufacture, Storage, and Import of Hazardous Chemical Rules of 1989 have been formulated to regulate usage, storage, transportation, or import of hazardous chemicals in India. The Rules lay great emphasis on prevention of accidents that may occur while handling hazardous chemicals, and the operators of facilities handling such chemicals are required to

prepare on-site emergency plans and safety reports and to conduct safety audits. Further, such operators are also bound to disseminate information regarding major accidents or hazards likely to occur in the facility.

Similarly, the Ozone-Depleting Substances (Regulation and Control) Rules of 2000 have been framed to regulate production, consumption, sale, purchase, use, import, and export of ozone-depleting substances in India. The Rules prohibit ozone-depleting substances from being imported or exported to countries that are not a signatory to the Montreal Protocol.

Conclusion

The EPA is the single most important law on environment protection in India. The EPA and rules/regulations framed thereunder significantly impact almost all industrial operations in India in some way. The EPA and rules framed thereunder become relevant from the stage of conception of any development project or industry in India, including its location and potential environmental and social impact. The EPA continues to regulate the day-to-day functioning of an industry, discharge of effluents/emissions, use and storage of hazardous materials in the production process, generation of waste, and trade-related issues.

Time to Wake Up to Biodiversity Legislation

The Biological Diversity Act of 2002 (the Act) has been in force in India since 2004, but general awareness about its implications for industry utilizing biological resources is limited. The Act is misunderstood in many quarters as relevant only for researchers, intellectual property rights concerning genetic and biological resources, and commercial utilization of biological resources obtained from forests, national parks, reserves, and sanctuaries. This is far from the reality. The Act is all-encompassing and has the potential to impact almost all commercial activities involving use of biological resources or their byproducts, whether or not these are found inside or outside protected areas. Commercial activities of various industry sectors, such as food, medicine, and cosmetics, that involve access to, use of, or trade in biological and genetic resources may fall within the purview of the Act. Some common examples of bio-resources commercially utilized are papaine, clove, ginger, vanilla, rose, sandalwood, lavender, jasmine, taxol, quinine, and gumghatti.

The misconception is perhaps due to the reason that while the Act has been in force for many years, statutory bodies responsible for the implementation of the Act were still being established. The business community (including foreign corporations and their subsidiaries in India), therefore, has largely remained oblivious to the restrictions that the Act imposes on research, bio-surveying, bio-utilization, and commercial utilization of biological resources.

The object of the Act is conservation of biological diversity, sustainable use of its components, and fair and equitable sharing of benefits arising out of the use of biological resources, traditional knowledge, and matters connected

therewith. The Act was enacted by India pursuant to the 1992 United Nations Convention on Biological Diversity (CBD), which reaffirmed the sovereign rights of states over their biological resources. At present, there are about 175 parties to the CBD.

Attempts to obtain patents outside India on biological resources traditionally known to have medicinal and therapeutic properties, such as turmeric and neem, highlighted the need for introducing a stringent legal, regulatory, and administrative regime to impose checks on such practices. The Act is considered by many to be India's response to bio-piracy and a step toward conservation and sustainable use of biodiversity; however, critics argue that it will only legitimize commercial exploitation of biological and genetic resources by large corporations, deprive local communities (who have hitherto depended upon and contributed the most to conserve and sustain such resources) of the right to access and commercially exploit biological resources, increase red tape and corruption, and provide no real or tangible benefit to local communities.

Applicability of the Act

The intent of the Indian legislature was to restrict and regulate the use of biological resources by foreign nationals and entities in particular. However, it seems to have gone farther than intended: restrictions and regulations under Section 3 of the Act fall not only on foreign nationals and entities, but also on Indian entities having *any* non-Indian participation in their share capital or management. This implies that Indian companies having even insignificant non-Indian shareholding or representation on the board would also be treated like foreign nationals and entities. Indian citizens and corporations without non-Indian

participation are only required to give prior notice to the concerned state biodiversity board for utilization of biological resources for commercial or research purposes. The restriction on access to biological resources by foreign entities and individuals is in consonance with the CBD. The CBD enjoins upon the contracting parties to facilitate access to genetic resources for environmentally sound uses by other parties on mutually agreed terms and with prior informed consent of the country providing these resources. The recipient country must provide fair and equitable sharing of benefits arising from the use of genetic resources transferred. The CBD contemplates such facilitation of access by way of national legislation and/or regulations.

Commercial Utilization and Benefit Sharing

Under Section 3 of the Act, commercial utilization or research relating to any biological resource occurring in India or knowledge associated therewith by foreign nationals and entities, as well as by Indian entities having any non-Indian participation in their share capital or management, requires prior approval of the National Biodiversity Authority (NBA). Similarly, results of any research relating to any biological resource occurring in or obtained from India cannot be transferred to such individuals or entities without prior approval of the NBA.

The implications of such broadly worded provisions on the flow of foreign direct investment and foreign trade are likely to be considerable. At the time of granting the approval, the NBA can impose terms and conditions to secure equitable sharing of benefits arising out of the use of accessed biological resources, their byproducts, innovations, and practices associated with their use, application, and knowledge relating thereto. Such conditions may include imposition of charges by way of royalty and equitable sharing of benefits arising out of the biological resources with local bodies or the benefit claimers,¹ including local communities. Equitable sharing of benefits may be provided by way of (a) grant of joint ownership of intellectual property rights to the NBA or, where the benefit claimers are identified, to such benefit claimers; (b) transfer of technology; (c) location of production and research and development units in such areas that will facilitate better living standards to the benefit claimers; (d) association of Indian scientists, benefit claimers, and local people with research and development in biological resources and bio-surveying and bio-utilization; (e) setting up a fund for aiding the cause of benefit claimers; (f) payment of

monetary compensation and non-monetary benefits to the benefit claimers as determined by the NBA.

As per the Biological Diversity Rules of 2004, the formula for benefit-sharing is to be determined on a case-by-case basis. However, benefits are mutually agreed upon between the persons applying for such approval and the NBA in consultation with the local bodies and benefit claimers. Benefits may be decided in light of the factors, such as defined parameters of access, extent of use, sustainability aspect, impact, and expected outcome levels, including measures ensuring conservation of biological diversity.

Unless Section 3 of the Act is appropriately amended to limit its applicability only to foreign individuals and entities and their subsidiaries in India, almost all listed companies in India dealing in commercial utilization of biological resources may come within the purview of Section 3 of the Act, as foreign institutional investors have substantial investment in listed companies.

Any person desiring to access biological resources for research or for commercial utilization is required to apply, in the prescribed form, to the NBA along with the statutory fee of Rs. 10,000 (USD 220). The NBA is required to process applications within six months. The process of approval involves deliberations and consultation among the NBA and other stakeholders. The approval is granted in the form of a written agreement between NBA and applicant. The agreement sets out the purpose of the application, a description of the biological resource, the intended use of the resource, limitations on access and use of the resource, benefit-sharing obligations, and other terms and conditions.

Intellectual Property Right Issues

Under the Act, any person who intends to register an intellectual property right (IPR) for an invention based on any research or information on a biological resource obtained from India is required to obtain prior approval of the NBA before applying. This provision also applies to those IPR applications that are filed or intended to be filed outside India. Though it is not clear how this condition will be enforced, such IPRs, if obtained without the approval of the NBA, will not provide any protection in India.

In the case of patents, the aforesaid approval of the NBA may also be obtained after the acceptance of the patent but before the sealing of the patent by the concerned patent authority. While granting the approval, the NBA may impose a benefit-sharing fee or royalty, or both, or impose conditions, such as sharing financial benefits arising out of the commercial utilization of such rights. To check

¹ The term "benefit claimers" has been defined under the Act to mean conservers of biological resources, their byproducts, and creators and holders of knowledge and information relating to the use of such biological resources, innovations, and practices associated with such use and application.

cases relating to bio-piracy, the NBA has been specifically empowered to oppose the grant of IPR in any country outside India on any biological/genetic resource obtained from India or traditional knowledge associated with such resource.

However, there are many biological resources that are not exclusively found in India and are commonly found in many countries. Imposition of benefit-sharing obligations by the NBA in respect of patents for products invented from such commonly found biological resources would not only be onerous, but unjustified. Assuming that commonly found or traded biological resources will be exempted from the application of the Act under Section 40 of the Act, the fact remains that there will still be many threatened or rare species of plants, animals, marine life, and micro-organisms that live in many countries with climatic conditions similar to India, especially countries sharing borders with India. Many biodiversity hot spots in India extend beyond the territorial boundaries of India into neighboring countries.

While there is no argument that no one should be allowed to obtain any IPR over genetic material obtained from any biological resource that is traditionally known to have a beneficial application, the real issue arises when the invention is not based upon any traditional knowledge and the biological resource or the genetic material is found in more than one country. The Act does not consider such circumstances, and imposition of any benefit-sharing by way of royalty or any other means on commercial utilization of such rights by the NBA would not be in consonance with the spirit of the CBD.

Penalties

The Act provides for stringent penalties for noncompliance. Noncompliance with the provisions of Sections 3, 4, and 6 (relevant to foreign entities and individuals) is punishable by imprisonment for a term of up to five years or by a maximum fine of ten lakh rupees (approximately USD 25,000) or such fine that is commensurate with the damage caused, where the damage caused exceeds ten lakh rupees, or both.

To ensure that the Act does not adversely affect normal trade-related activities, the central government is empowered under Section 40 of the Act to declare, in consultation with the NBA, that the provisions of the Act shall not apply to any items normally traded as commodities, including biological resources such as green pepper, tamarind concentrates, ginger powder, cumin powder, coffee, cashews, tobacco, wheat, and rice. Such exemptions should be made via notification in the Official Gazette. Though the NBA has prepared a list of such

normally traded commodities, the central government has yet to address the list or exempt any biological resource.

Until normally traded commodities are exempted under Section 40, any trade in such commodities without compliance with the provisions of the Act may render the person engaged in such trade liable to prosecution and penalties.

Conclusion

It is advisable for all foreign entities and their subsidiaries in India dealing with any biological resource found in India to apply for registration under Section 3 of the Act. Though normally traded commodities are likely to be exempted from the application of the Act, until such time as such a list is announced, any person dealing in such biological resources should ensure compliance with the provisions of the Act.

First Arrest and Conviction Under the Biological Diversity Act of 2002

On June 22, 2008, two Czech citizens were arrested in the Srikhola in Darjeeling district, West Bengal, for illegal possession of rare insects. These Czech citizens were not only booked under the Wildlife Protection Act of 1972 but also under the Biological Diversity Act of 2002. In fact, this was the first case of conviction and sentencing under the Act. The case was also historic for being the quickest trial involving wildlife crime, lasting less than three months from arrest to sentencing.

The two Czech citizens were involved in wildlife research, and one of them was an entomologist of international repute. About 500 beetles and two bottles containing preserved insects (in different stages of growth) were seized. The collection included certain species listed under the Wildlife Protection Act of 1972.

It is pertinent to note that foreign nationals and entities desiring to conduct any research relating to any biological resource occurring in India or knowledge associated therewith require prior approval of the National Biodiversity Authority. However, the Czech researchers did not have any such authorization. One of the Czech researchers was sentenced to three years of imprisonment and a fine of Rs. 50,000 (USD 1,100), while the other researcher was levied a fine of Rs. 20,000 (USD 425).

The arrest and conviction of the Czech nationals may just be the precursor to stringent enforcement measures that regulatory authorities are likely to adopt in the near future.

Moving Toward Environmentally Sound Management of Electronic Waste

In March 2008, the Central Pollution Control Board (CPCB) formulated Guidelines for Environmentally Sound Management of Electronic Waste (E-Waste Guidelines) in consultation with the Ministry of Environment & Forests (MoEF). The E-Waste Guidelines are the first policy document dealing specifically with prevention, management, treatment, recycling, and disposal of electronic waste (e-waste) in India. Though the National Environment Policy of 2006 stipulated development and enforcement of regulations and guidelines for management of e-waste as part of the hazardous waste regime, no specific law on this subject was framed at that time.

The hazardous and solid waste rules in India do not make any direct reference to e-waste or its management. Consequently, e-waste collection, recycling, and disposal have largely remained unregulated. The major dismantling operations with respect to end-of-life electronic products are undertaken in an unorganized and informal sector in a hazardous manner. Thus, the E-Waste Guidelines are a welcome step for providing necessary guidance to the manufacturers, recyclers, customers, generators, collectors, transporters, dismantlers, and enforcement agencies on critical aspects of e-waste management. However, these remain voluntary guidelines only, and they fail to provide sufficient guidance and enforceability to fully meet the need for specific regulations for e-waste management.

The E-Waste Guidelines have been framed to provide guidance for identification of various sources of waste in electrical and electronic equipment and prescribe procedures for handling e-waste in an environmentally sound manner. These guidelines lay down the broad outline that should be followed for e-waste management. However, specific methods for treatment and disposal of specific wastes need to be worked out according to the hazard/risk potential of the waste under question. It is anticipated that the state governments and/or the state pollution control boards will take note of the recommendations in the E-Waste Guidelines and prescribe appropriate norms as may be deemed necessary.

The E-Waste Guidelines not only emphasize the need for adoption of environmentally sound technologies and methods for e-waste treatment and disposal, but also introduce, for the first time in India, certain internationally accepted principles and practices, such as restriction of the use of certain hazardous substances

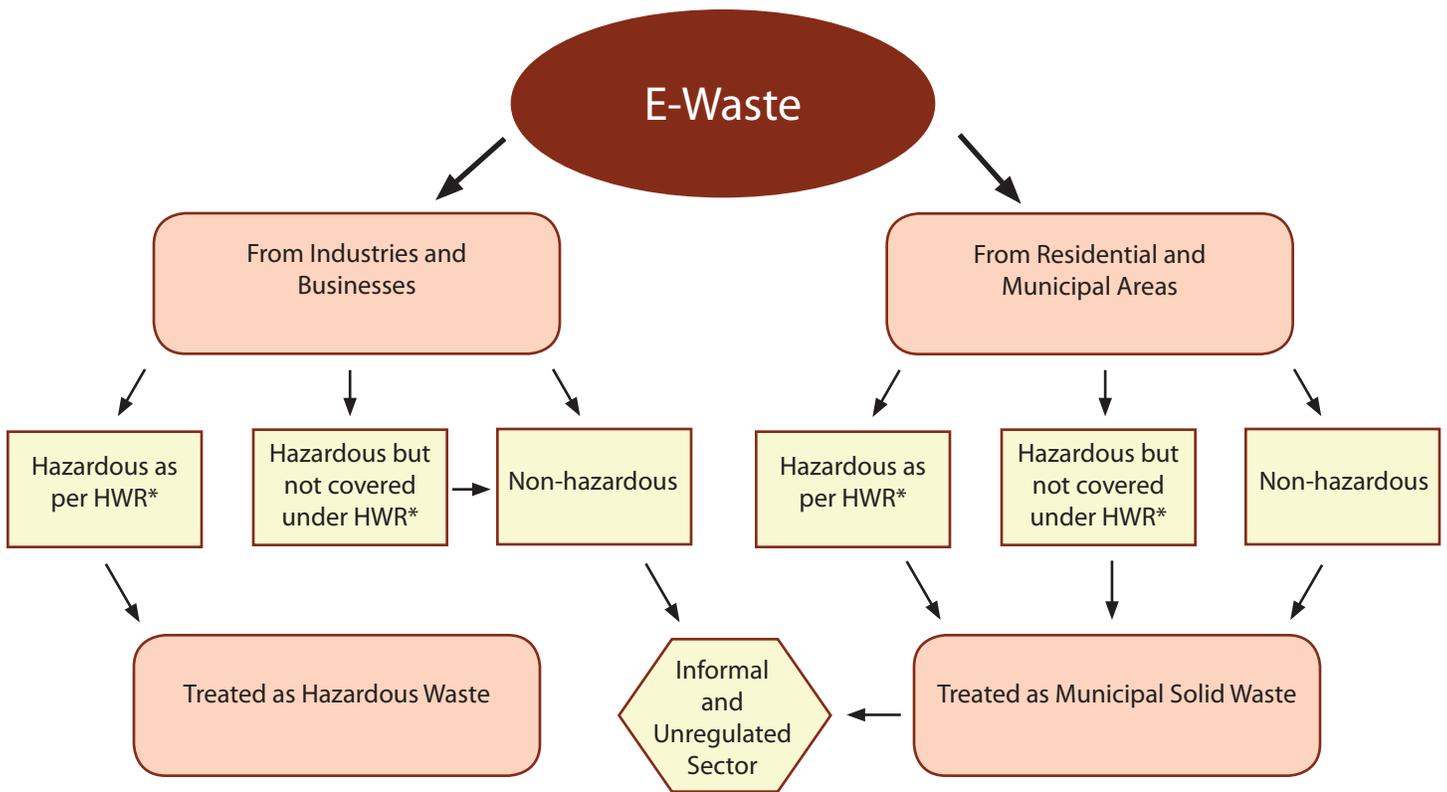
(RoHS) in electrical and electronic equipment, extended producer responsibility, and product take-back. The E-Waste Guidelines stress incorporation of such standards under the regulatory regime.

The Need for a Comprehensive Definition of E-Waste

Effective management of e-waste can only begin with a comprehensive definition that includes all components and sources of e-waste. The E-Waste Guidelines define e-waste as “waste electrical and electronic equipment including all components, sub assemblies and their fractions except batteries defined under the Hazardous Waste Rules.”

Regulation of e-waste is confounded by the overlapping nature of India's other waste management regimes. The Hazardous Wastes (Management, Handling, and Transboundary Management) Rules of 2008 (Hazardous Waste Rules) do not provide a definition for e-waste. However, the definition of hazardous waste is broad and may cover e-waste and its components in certain instances. For example, the presence of toxic substances such as cadmium, mercury, copper, cobalt, lead, etc., which are generally found in e-waste, would render such waste hazardous, provided the concentration of such substances in any e-waste is equal to or above the specified threshold limits. On the flip side, a number of end-of-life electronic products, which otherwise need scientific collection and disposal, would not trigger applicability of Hazardous Waste Rules, if the presence of hazardous substances is less than the prescribed limit. For example, if the presence of mercury in waste generated from end-of-life products such as LCDs, batteries, or fluorescent lamps or parts thereof, is less than 50 mg/kg, such electronic waste would not qualify as hazardous waste under the Hazardous Waste Rules and in turn would find its way into unorganized and unregulated recycling units.

The other complication is that household goods and consumer appliances generated from municipal areas, which are a major component of e-waste in India, fall within the purview of the Municipal Solid Waste (Management and Handling) Rules of 2000. These rules provide a very wide definition of municipal solid wastes that includes almost all waste, including commercial and residential waste generated from municipal areas other than industrial hazardous waste and untreated bio-medical waste. As the Hazardous Waste Rules do not apply to waste



* Hazardous waste rules

covered under the Municipal Solid Waste (Management and Handling) Rules, such waste is not within the ambit of Hazardous Waste Rules even if it contains hazardous components. Thus, identification, tracking, collection, and disposal of such waste continue to be thorny issues. On the other hand, governing non-hazardous e-waste under the hazardous waste regime, as contemplated under the E-Waste Guidelines, is not feasible. Therefore, separate regulations for e-waste management are a necessity that the E-Waste Guidelines have failed to appreciate.

Adoption of Cleaner Manufacturing Technologies

The National Environmental Policy of 2006 stresses adoption of clean technologies that minimize the generation of waste streams in the production processes instead of end-of-pipe abatement technologies. The E-Waste Guidelines also emphasize cleaner technologies, including reducing the use of hazardous substances such as lead, cadmium, mercury, polychlorinated biphenyls, and other toxic and hazardous substances for which safe substitutes are available. In this regard, the E-Waste Guidelines have taken a step to cut down on the use of hazardous substances and have set threshold limits for such hazardous substances, including lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ether.

Extended Producer Responsibility

The E-Waste Guidelines emphasize the need for including extended producer responsibility (EPR) in the legislative framework and for making it a mandatory activity associated with the production of electronic and electrical equipment. The same is all the more critical for India as a huge quantity of waste generated from PCs, mobile phones, TVs, etc. finds its way to the informal recyclers, which in turn means uncontrolled recycling and disposal of e-waste that poses a grave environmental and health hazard. In India, there is no legislation mandating that manufacturers facilitate take-back of end-of-life products from consumers for the purpose of recycling, treatment, and disposal, except for certain regulations relating to batteries (see sidebar, page 11).

As per the E-Waste Guidelines, a producer should be responsible for the entire life cycle of the product, including take-back, recycle, and final disposal. To facilitate the operation of the buyback system, producers of all electronic and electrical equipment should be allowed to levy an appropriate fee on the product at the point of sale. The producer responsibility could be either individual or collective. The individual model requires each producer to be responsible for managing the e-waste generated by the products it manufactured. The individual producers can have direct contact with dismantlers or recyclers,

which will allow them to obtain the reusable components from their obsolete equipment. In the case of collective producer responsibility, the producer would collect the end-of-life electronic products from a collection agency, which will be responsible for collecting the waste from the generator. Through the collection agency, the producers will have to pay a fixed price for their products to the generator.

While the manufacturers' responsibility in e-waste disposal and recycling is critical, fixing liabilities on manufacturers alone would not be sufficient. The effective management of e-waste entails involvement of consumers, regulatory authorities, collection agencies, and recyclers. However, the E-Waste Guidelines primarily provide for producers' roles in e-waste recycling and disposal, and the responsibility of other stakeholders in facilitating such recycling and disposal has not been envisaged. This is a gap in the guidelines, as a huge quantity of electronic products is imported into India. Since the import and customs regulations or the E-Waste Guidelines do not stipulate mandatory take-back of end-of-life electronic products by importers or foreign manufacturers, the collection, recycling, and disposal of such electrical equipment would continue to pose a challenge.

Conclusion

Management of the ever-increasing volume of e-waste is a mammoth task for regulatory authorities. On account of rapid growth of the IT and electronics industry,

high obsolescence rate of electronic products, growing import of second-hand electronic goods and e-waste, and unregulated recycling of e-waste in an informal sector, the e-waste menace in India may culminate into a crisis situation. The existing regulatory framework and infrastructure is inadequate to deal with this situation.

The principles of RoHS, EPR, and product take-back have been envisaged for the first time under the E-Waste Guidelines. However, the E-Waste Guidelines are not legally binding and serve only as guidance. Further, there are certain areas where further clarity is required, such as definition of e-waste, management of non-hazardous e-waste, and responsibilities of stakeholders other than manufacturers in product take-back. Similarly, the E-Waste Guidelines do not contain any special provisions for tracking, identification, collection, recycling, treatment, or disposal of e-waste, particularly household consumer goods. Therefore, the legislature and policymakers should ensure that a comprehensive regulatory framework addressing all issues ranging from cleaner production operations, trade, collection, waste classification, recycling, reuse, and disposal of electronic products is put in place. Such a regime must provide for sharing the responsibility for waste management between manufacturers, consumers, dealers, enforcement agencies, and the government. Fiscal incentives must be provided to manufacturers that use cleaner technologies and reduce use of toxic substances. Guidance on proper handling and management of e-waste must be provided to consumers.

Regulations for Taking Back Used Batteries

The Batteries (Management and Handling) Rules of 2001 (Battery Rules) require the manufacturers, importers, assemblers, and re-conditioners of lead acid batteries to ensure that used batteries are collected against new batteries sold. However, it excludes those batteries that are sold to original equipment manufacturers and bulk consumers. The manufacturers, assemblers, and re-conditioners are required to collect 90% of the new batteries sold. Consumers, including bulk consumers, are required to ensure that the used batteries are not disposed of in any manner other than depositing with manufacturers, assemblers, re-conditioners, recyclers, importers, etc. Additionally, bulk consumers are required to submit half-yearly returns in the prescribed form with the SPCB. A mechanism for setting up centers to collect used batteries from consumers and dealers has also been provided under the Battery Rules. Further, the Bureau of Indian Standards has established "eco-mark" criteria for automotive lead acid batteries and dry cell batteries. One of the most important conditions for granting the eco-mark is the existence of a collection payback system for the used products.

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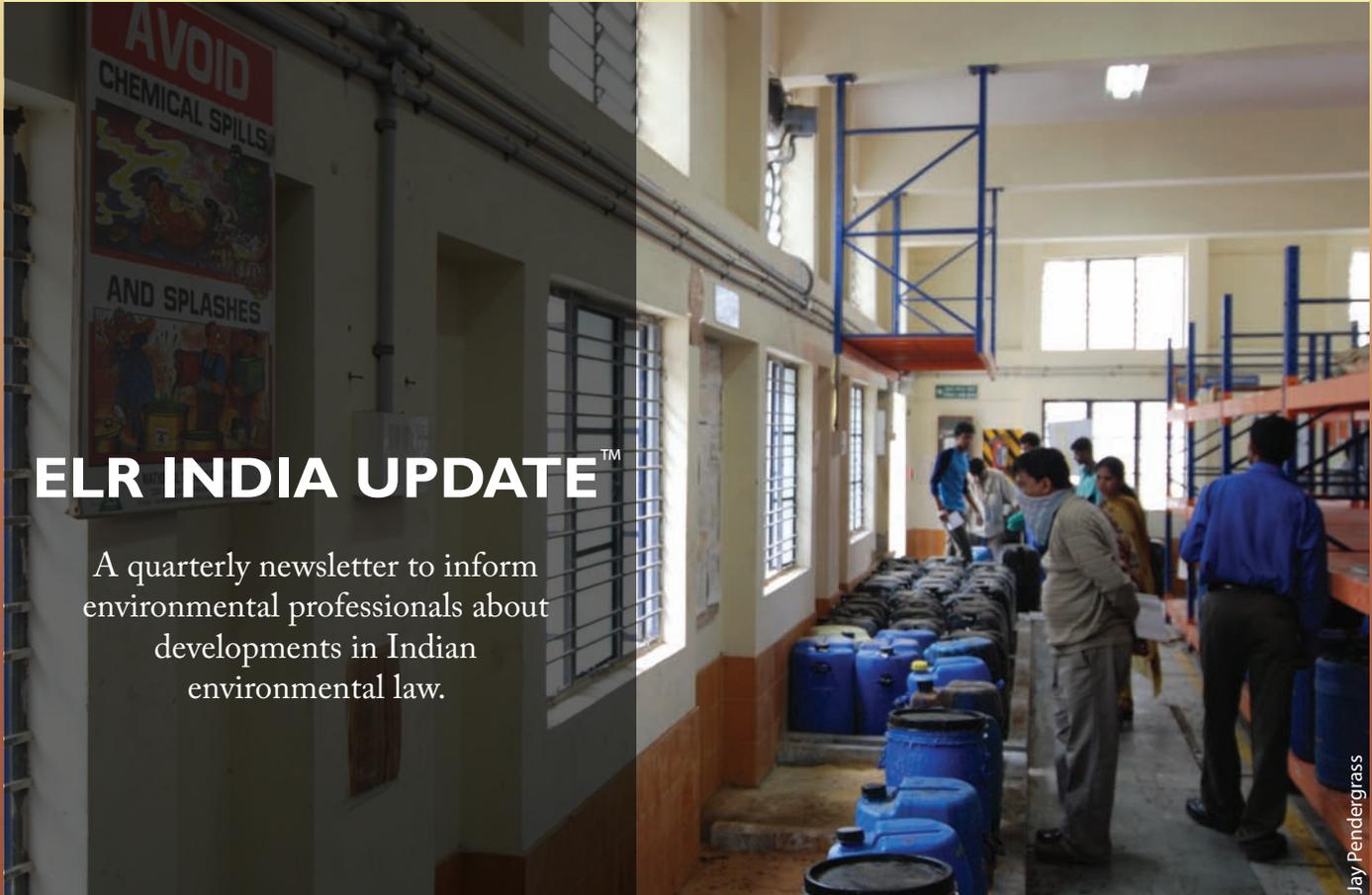
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