

# INTERNATIONAL ISSUES IN HAZARDOUS WASTE MANAGEMENT

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## Contents

1. Transboundary Issues
  - 1.1 Legality of the export
  - 1.2 Existence of Hazardous Waste Management Technical Knowledge and Infrastructure in the Importing State
  - 1.3 Health and Safety Implications of Transboundary Movement of Hazardous Wastes
  - 1.4 Equity Issues
  - 1.5 Liability and Compensation Issues
2. Specific Agreements and Accords
  - 2.1 The London Dumping Convention
  - 2.2 Code of Practice for the International Transboundary Movement of Radioactive Wastes
  - 2.3 The Cairo Guidelines
  - 2.4 Dakar Declaration
  - 2.5 Lome IV Convention, Article 39
  - 2.6 Bamako Convention
  - 2.7 Barcelona Convention
  - 2.8 Waigani Convention
  - 2.9 Basel Convention
3. Market Instruments
  - 3.1 Introduction
  - 3.2 Potential Application of Market Instruments
4. Institutional Capacities
  - 4.1 Implementing the Basel Convention

## 4.2 National Capacities

## 4.3 Regional Centers

## 5. A Global Review of the Adequacy of Existing Institutional Capacities

### Glossary

### Bibliography

### Biographical Sketches

## Summary

Hazardous wastes generated by human activity pose the risk of damage to human health and to the environment, and their negative impact is accentuated when wastes are not managed properly. Sound management of hazardous wastes covers activities right from the point of generation to the point of disposal of such wastes (see Box 1. Agenda 21, Hazardous Wastes and Future Directions). The need to dispose of the wastes, coupled with the high cost of disposal in developed countries that results from stringent regulatory regimes, led to the uncontrolled movement of such wastes, particularly to developing countries, from the late 1970s to the 1980s.

The internationalization of hazardous waste management has led to the emergence of salient issues and actions. One important issue is the *modus operandi* for transboundary movement of hazardous wastes, if the movement is allowed to occur. Transboundary issues occur when hazardous wastes, generated in a sovereign state, are transported through one or more sovereign states to another sovereign state for disposal. Such movement of hazardous waste occurs for a variety of reasons, notably the high disposal costs in the state of generation, the minimal awareness in the importing state of the negative effects of unsound disposal, and the lack of technical knowledge concerning what constitutes a sound disposal facility for such wastes. The major transboundary issues include the legality of the movement of hazardous wastes across national boundaries; the extent to which expertise on the management of these wastes is available in destination countries, which are often developing nations; the health and safety implications of the transboundary movements; equity issues; and legal issues, especially as they relate to liability and compensation.

At the United Nations Conference on Environment and Development (UNCED), or Earth Summit (1992, Brazil), concern over toxic chemical production and its management was raised. Agenda 21 addressed this, and the agenda “focuses on developing systematic and coordinated actions that are intended to evaluate, prevent, and control risks related to existing chemicals found in the environment as a result of commerce or as polluting activities”.

Preventive regulations were enacted for new chemicals, and these regulations require all new chemicals to be evaluated for toxicity before being marketed. The idea that a precautionary approach should be taken in managing the life cycle of toxic chemicals to reduce risk was key to Agenda 21. In addition, Agenda 21 contained programs that promote the minimization of hazardous wastes, strengthen institutional capacities in waste management, and prevent illegal international traffic of wastes.

Preventative approaches to hazardous waste management can be very successful. In fact, source reduction activities often result not only in a significant decrease of toxic wastes, but also in saved money and increased product yields. The cost of implementing such changes is often non-existent, reduced or paid back very quickly. Despite the positive results that have been found, companies

have been slow to adopt such waste reduction policies.

Some areas to be pursued in hazardous waste management are accelerated technology innovation, changing consumer preferences and negative behaviors, and pursuing more sound industrial management. Industrial management should include full accounting systems (including materials balance training) and source-reduction technology implementation. These technologies and management technologies must be shared with developing countries as well.

Source:

Cortinas de Nava, Cristina. Worldwide Overview of Hazardous Wastes. Hazardous Wastes and Public Approaches. Hazardous Waste Conference, 1993

### Box 1. Agenda 21, Hazardous Wastes and Future Directions

These transboundary issues have also led to the emergence of various global, regional and sub-regional treaties, accords and agreements aimed at reducing the negative impacts of the generation and transboundary movement of hazardous wastes. Some of these accords contributed immensely towards shaping the manner in which many of the issues listed above are currently handled among nations. Such accords include the London Dumping Convention (1973), the Code of Practice of the International Transboundary Movement of Radioactive Wastes (1990), the Cairo Guidelines (1987), the Dakar Declaration (1989), Article 39 of the Lome IV Convention (1989), the Bamako Convention (1991), the Barcelona Convention (1976/1995), the Waigani Convention (1995), and the Basel Convention (1992). Most recently, agreement has been reached by the General Council of UNEP to ban the production, import, export, disposal and use of twelve persistent organic pollutants (certain pesticides, PCBs, hexachlorobenzene, dioxins and furans). More information is given in Box 2.

After long discussions in South Africa, an agreement to phase out 12 of the most persistent organic pollutants (POPs) has been signed by 122 countries. The success of this treaty, which covers production, import, export, disposal and use of the listed chemicals, which have been linked to cancers, nervous system damage, immuno-deficiencies and birth defects, is dependent on governments promoting the best available practices and technologies for replacing the use of these chemicals. To do this, governments must also create action plans and implement legislation to prevent the production and use of the substances.

Coined the 'dirty dozen,' this list includes eight pesticides (aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, mirex and toxaphene), PCBs, hexachlorobenzene, and dioxins and furans. Dioxins and furans will be subject to increasing emissions limits, and use of DDT will still be allowed to control malarial mosquitoes. PCBs, which are often still in use in electrical transformers, will also not be subject to an immediate ban. The rest of the chemicals, however, will be banned immediately.

The treaty, which was reached at the summit of the United Nations Environment Programme, will be formally adopted and signed by United Nations ministers in Stockholm May 2001. The treaty will go into force when 50 of the countries that have signed the treaty then ratify it, and subsequent revisions may extend the treaty to cover other POPs.

Source:

UN agrees POPs phase-out treaty. Process Engineering. Centaur Communications Ltd. January 19, 2001.

## Box 2. UN Agrees on POPS Phase-out Treaty

There are a number of roles that market instruments can play in achieving the global goal of sound management of hazardous and other wastes. Market instruments can be used as tools for promoting optimal interactions between market components for mutual benefit. Such market instruments include tariffs, taxes, duties, surcharges, and incentives (e.g. low interest loans, tax holidays, etc.). Market instruments can be applied to promote the reduction of hazardous waste generation, to promote the development of environmentally sound disposal facilities, and to limit transboundary movement of wastes.

Lastly, there are requirements for institutional capacities in order to adequately cope with the sound management of hazardous wastes at the international, regional and national levels. National institutional capacities include the establishment of country focal agencies or ministries with responsibility for sound environmental management. Apart from such institutions, instruments of intervention have been implemented in some countries that are signatories to specific conventions like the Basel Convention. Such instruments include legislation for the control of transboundary movement of hazardous wastes, legislation for the management of hazardous and other wastes, and regulations and codes of practice for hazardous waste disposal. The scope of such national legislation varies from country to country, but in general many developing countries have not yet established such regulations or codes of practice. The Basel Convention recommended the establishment of regional and sub-regional centers for hazardous waste management training, technology transfer, and the promotion of methods to minimize hazardous waste generation. Such centers are of utmost importance to countries that lack trained manpower and appropriate technology.

### 1. Transboundary Issues

When hazardous wastes generated in a sovereign State are disposed of in another sovereign State, transboundary issues arise (see Box 3. International Toxic Waste Dumping in India). Some of the pertinent issues include whether or not the transboundary movement is taking place with the consent of the importing State; whether or not the importing State possesses the ability to manage the waste, especially with regard to the handling, storage and final disposal; whether or not there is a sound understanding of the impact of the transboundary movement of the waste, especially concerning the health and safety implications in the importing State; and whether or not technical understanding to minimize the negative impacts of the transboundary movement exists within the importing State. Equity and legal issues are also pertinent.

In India's Bombay Port in November, 2000, more than 160 containers of hazardous toxic wastes were illegally imported by traders based in the Arabian Gulf, and the port was stuck with these wastes. The environmental group Greenpeace advocated returning the wastes to the exporters, at the expense of the exporters.

Despite a Supreme Court order prohibiting the import of toxic wastes, there have been complaints that the Indian Ministry of Environment has not prevented such waste dumping. In fact, Greenpeace data collected from government statistics, suggests that more

than 100,887 tons of waste, including hazardous and potentially hazardous waste, entered India illegally in 1998 and 1999. Greenpeace also stated that zinc ash, lead material, used batteries and metal scrap from cadmium, chromium, cobalt, antimony, hafnium and thallium have been exported freely to India by Australia, Belgium, Britain, Denmark, Germany, the Netherlands, Norway and USA. In addition to being illegal under Indian law, these shipments are also illegal under European and Australian laws, which have banned the export of hazardous wastes to non-OECD countries. Greenpeace has commented that in addition to the shortcomings of India's environment ministry, the fault for such illegal exports lies equally with the exporters and exporting countries that are exploiting the limitations of India's regulatory infrastructure in order to "export their environmental liabilities".

Sources:

Foreign toxic waste dumped in Bombay port: Greenpeace. *Agence France Presse*. November 3, 2000  
India a dumping ground for toxic garbage: Greenpeace. *Agence France Presse*. September 11, 2000

### Box 3. International Toxic Waste Dumping in India

In the early 1980s, there was a growing tendency to export hazardous wastes from developed countries to the developing countries of Africa, Eastern and Central Europe for final disposal. This tendency was a result of the following:

- The management and disposal of hazardous wastes in developed countries was strictly regulated by national laws, and it was often expensive because of these restrictions and the resulting technologically advanced disposal methods;
- Due to superior information availability, most citizens of industrial nations had already developed a "not in my backyard" attitude toward the disposal of hazardous wastes in their localities, making it difficult to site waste management projects;
- As a result of the generally low level of education and the unavailability of appropriate information in developing countries, there was little public awareness of the potential negative impacts of hazardous wastes, so citizens were willing to accept the storage of such wastes within their living vicinity (See Box 4: Toxic Waste Dumped in Koko, Nigeria in 1987);
- The cost of disposal of hazardous wastes in most developing countries is a fraction of the cost in most developed nations [because of fewer regulations, lower technology disposal methods, and lower safety standards].

All the factors discussed above served as incentives in the early 1980s for the export of hazardous wastes to developing countries. This led to the evolution of a variety of transboundary issues, which are discussed below.

#### 1.1 Legality of the export

The main legal issue in hazardous waste transport is whether or not the importing nation, and the other nations through whose geographical jurisdiction the waste will travel, are aware of the export and has consented to it. Consent of the importing nation and permission of the transit States is a necessary condition for proper control and

monitoring of the movement of such materials. Such an arrangement will also enhance mutual respect for territorial integrity. Most developing countries do not have the necessary legal and administrative framework to effectively control and prevent the dumping of hazardous wastes in their countries.

On 19<sup>th</sup> of September 1987, a Danish Ship, the MV Danix, shipped 3500 tonnes of toxic waste, contained in 8000 drums, to Nigeria. These wastes, consisting of polychlorinated biphenyls (PCBs), methyl melamine, dimethyl formamide, ethylacetate, formaldehydes, etc. were dumped at Koko, a small coastal town in Bendel State (now Delta State). They were allegedly shipped by a Mr. Gianfranco Raeffeli from Italy and were stored in the backyard of Chief Sunday Nana. Chief Nana was paid a monthly storage fee of ₦500, the equivalent of US\$5. Ignorant of the dangers associated with these substances, Chief Nana soon converted some of the drums into water storage containers for himself and his family. Water stored in these drums was consumed and used for other domestic activities such as cooking and washing.

No hint of the presence of these wastes was given until almost a year later, when a West German registered ship moved another 1000 tonnes of waste to Nigeria (April 1988) to the same storage location. Two months after this shipment, a newspaper reporter received a hint of this occurrence in a letter written by Nigerian students then residing in Pisa, Italy. Copies of the letter were sent to several newspapers in Nigeria, which led to the Guardian, a leading Nigerian newspaper, dispatching an investigation team to verify the authenticity of the students' claims. The team soon unearthed the waste dump in Koko, which consisted of several drums, steel casts, huge polypropylene bags and containers marked "R", which is an internationally acknowledged method of labeling radioactive industrial waste materials.

This led to a diplomatic face-off between Nigeria and Italy, which was resolved by sending the wastes back to Italy. The Nigerian Government's prompt evacuation of the wastes underscored the need for speedy action, which was particularly important because the containers were exposed to the vagaries of weather, and constant rain had washed some of the chemicals into the groundwater.

The man who harbored the wastes was relocated to a rented apartment by the government pending the completion of a new house for him. Believing that the entire area had been polluted, the government initially had plans to relocate the inhabitants of Koko, but expert studies showed that "there were no immediate harmful effects on human health."

The government then commenced remediation of the polluted site. Soils of the dumpsite were excavated to a depth of 60cm, containerized and shipped in stages back to Italy. Site restoration activities received technical assistance from the British, Japanese, American and Soviet governments. Also, experts from the Harwell Laboratory and the Italian Ministry of Environment contributed to the effort. Following the Koko episode, the Nigerian government accelerated its move toward the establishment of an environmental monitoring organization. This culminated in the creation of the Federal Environmental Protection Agency (FEPA), thus commencing a new agenda for environmental management in Nigeria.

Source:

Akingbade, T., Nigeria: on the trail of the environment. Triple "E" Systems Associates Ltd. Lagos, Nigeria. (ISBN 978-31493-0-X), Pp.155. 1991.

#### Box 4. Toxic Waste Dumped in Koko, Nigeria in 1987

### 1.2 Existence of Hazardous Waste Management Technical Knowledge and Infrastructure in the Importing State

Technical capacity, infrastructure and institutions are needed for the effective management of hazardous waste, especially in the importing state where the waste will finally be disposed. To a large extent, developing countries lack the technical capability and the infrastructure to dispose of hazardous wastes in an environmentally sound way. As a result, hazardous wastes have been deposited illegally and in a way that is often damaging to human health and the environment. In order to forestall illegal waste movements in both the transit and final disposal States, knowledge about hazardous wastes and sound institutional capacity must exist to ensure proper identification, monitoring and control of such wastes, especially at border posts. The knowledge base for these activities is often not available in developing countries. (For discussion of legal issues involved in hazardous waste and multinational corporations, see Box 5).

Multinational companies have relocated hazardous waste activities to developing countries in order to take advantage of the global economy. Cases like the Bhopal disaster demonstrate the ill effects that can result and the difficulties in obtaining enough compensation. These problems are exacerbated by the export of hazardous waste as well, but while the Basel Convention deals with fault and compensation for such exports, no such universal agreement deals with liability and compensation in the case of imported hazardous technology.

In the case of the Bhopal tragedy, the domestic company that caused the damage had few assets with which to pay any judgment against it. There are then several problems if plaintiffs wish to sue in the courts of the exporting country against the foreign company that supplied the hazardous technology. First, in the case of Bhopal, in which an English company provided the faulty technology, it is difficult under English law to make one person responsible for the acts of another. To do this, it must be shown that the English company broke a primary duty of care or the doctrine of separate corporate personality must be disregarded to make an English company liable for the foreign company's acts.

A plaintiff that suffers due to the actions of a domestic company with few assets is in a difficult position. While he may sue the foreign provider of the faulty technology in local courts, any judgment in the plaintiff's favor is not likely to be enforced because the foreign company has little "presence" in the local jurisdiction. If the plaintiff wishes to sue in the foreign court, there are difficulties in jurisdiction, and English courts, for example, offer no prospect of success in such a case because an English company is not likely to be found liable for a foreign company's actions. There is some possibility that an argument that the foreign company has breached some primary duty concerning the competency of the company to which equipment is sold might succeed, but most companies can show compliance with this. Several cases in England involving liability in relation to hazardous substances have come out in favor of English companies. Prospects are better for a plaintiff that suffers due to the export of hazardous waste, but there are still difficulties in telling exactly what the liabilities are for the defendant. However, liability is complicated because the law allows exporting activities to be divided by a variety of companies. In the case of transport accidents, local court judgments would have the same enforcement difficulties as is the case for faulty technology lawsuits, but there would not be as much difficulty concerning jurisdiction of foreign courts.

All problems concerning waste export could be addressed if the notifying company was forced to take out liability insurance to cover the importing company's liabilities concerning disposal or recovery. In this case, the cost of the liability insurance premiums would fall on the exporting company, but they could then put be on to the importing company. The total costs, including the cost of liability insurance covering all points of hazardous waste management, would reflect the true environmental costs of the transaction. This type of regulation which requires the purchase of liability insurance, born by both exporters and importers of hazardous wastes and hazardous waste technologies, to cover all facets of hazardous waste management would allow foreign plaintiffs to obtain adequate compensation in the case of hazardous waste accident. In turn, the purposes of the

Basel Convention, as evident in Article 12, would be fulfilled.

Source: Baughen, Simon. Multinationals and the Export of Hazard. *The Modern Law Review*. 59 (1995): 54-71.

## Box 5. Legal Problems Involved in Hazardous Waste Accidents Involving Multinational Corporations

### 1.3 Health and Safety Implications of Transboundary Movement of Hazardous Wastes

Proper understanding of the health and safety implications of hazardous waste movement is necessary for implementing procedures to ensure that humans and the environment are protected. Most developing countries lack this knowledge, so it is doubtful whether schemes for the safe management of such wastes can be adopted in these countries in the near future. In addition to affecting those involved in transporting the waste, unsound hazardous waste management can manifest itself through its effects on the ignorant nearby population.

### 1.4 Equity Issues

The basic equity question is whether or not it is morally justifiable to dispose of hazardous wastes generated in a particular country in other countries. Although 80% of the hazardous waste trade occurs between OECD countries, the fact that wastes generated in some of these nations have in the recent past found their way to some developing countries has opened up the need for global responsibilities. This moral responsibility is heightened when viewed in the context of the inferior knowledge possessed by less developed importing nations. The general consensus is that the international community must ensure that developing countries are protected from such transboundary disposal of hazardous wastes, if world peace and harmony are to be promoted.

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## Biographical Sketches

**Felix B. Dayo** received a B.Sc. degree in Chemical Engineering from the University of Ife, Ile-Ife (now Obafemi Awolowo University) in 1979, a M.S. degree in Nuclear Engineering from the Horace Rackham School of Graduate Studies, the University of Michigan, Ann Arbor, MI. in 1979 and the Ph.D. in Engineering and Public Policy from the Carnegie Institute, Carnegie Mellon University, Pittsburgh, PA. in 1982. He joined the Faculty of the Center for Energy Research and Development, Obafemi Awolowo University, Ile-Ife, Nigeria in early 1983 where he taught engineering, energy and environment related courses and carried out research on energy and environmental systems until 1992. In late 1992, Dr. Dayo and 5 other like minded investors incorporated Triple “E” Systems Associates Ltd., an energy, environment and engineering consulting firm in Nigeria and he became its pioneer Managing Director. Over the past two decades, under the leadership of Dr. Dayo, Triple “E” has carried out consultancy assignment to a diverse client groups including: Federal and State Governments in Nigeria; International Agencies such as---UNIDO, UNDP, the World Bank, AfDB, etc; Oil and Gas Sector Operators such as---Chevron Nigeria Plc, Shell Petroleum Development Company, ExxonMobil Nigeria etc; and manufacturing companies such as---Cadbury Nigeria Plc, Unilever Nigeria Plc, etc. In 2006, a North American office of the company was incorporated with corporate office in Laurel Maryland USA. Dr Dayo is currently: an Adjunct Professor of Engineering and Public Policy at Carnegie Mellon University, Pittsburgh, PA, a member of the CDM Methodology Panel and a member of the Small Scale CDM Working Group of the CDM Executive Board of the UNFCCC. He is a member of the following bodies: Member, Nigeria Society of Engineers; Member, Nigerian Society of Chemical Engineers; Affiliate, American Institute of Chemical Engineers; Member, International Association for Impact Assessment and; Member International Association for Energy Economics. Felix has published in several international journals and contributed to books in the areas of energy and environmental policies

**Babajide I. Alo** received a Ph.D degree in Chemistry from the University of Ibadan in 1980 some few years after a very brilliant undergraduate education in the same subject. Thereafter, he became a Faculty member in the Department of Chemistry at the University a Lagos where he started as a Lecturer, and currently a Professor of Chemistry at the University of Lagos. He has at various times been Head of Department of Chemistry, Dean of Faculty of Science and the Dean of the Post-Graduate School of University of Lagos. He has also consulted for various companies, especially in the oil and gas sector. Some of the projects in which he played a lead role include: EIA for the Nigeria Liquefied Natural Gas (NLNG); the Escravos Gas Project (EGP) Phase 1; EIA for the Brass Liquefied Natural Gas (BLNG) Project and EIA for the proposed Olokola Liquefied Natural Gas (OKLNG) Project. He is a member of several professional associations, including the Royal Institute of Chemists, the Nigerian Chemical Society, the Institute of Public Analysts, etc. He has over 100 papers and contributions to conferences, journals, books and symposiums.

**Adeolu Ojo** received a B.Sc. degree in Agriculture from the University of Ibadan, Ibadan, Nigeria in 1994 and a M.Sc. in Zoology specializing in Environmental Pollution and Ecotoxicology in 2000 from the University of Lagos, Lagos, Nigeria. Over the last one and a half decade, Adeolu has emerged as a young effective leader of inter-disciplinary environmental studies conducted for various clients in the oil and gas as well as other sectors of the Nigerian economy. Examples of the environmental projects that Adeolu has provided coordination leadership include: Environmental Impact Assessment (EIA) for the West African Gas Pipeline (WAGP) project, EIA for the Agbami Field Development Project, Baseline Studies for the OKLNG Project, EIA for the Olokola Gas Supply Pipeline project, EIA for the AES Barge Gas Turbine, and the EIA for the Dibi/Gbokoda Field Development Projects. He is currently a Senior Consultant and Head of the Environment unit at Triple “E” Systems Associates Ltd. He is a member of several professional associations such as the International Association for Impact Assessment (IAIA), an Associate member of the Institute for Environmental Management and Assessment (IEMA), the West African Association for Environmental Assessment (WAAEA), and the Nigerian Environmental Society (NES). He has written and presented several papers at various workshops and conferences and has made contributions to books and journals.