INDUSTRIES AND ENFORCEMENT

OF ENVIRONMENTAL LAW IN AFRICA

Industry Experts Review Environmental Practice







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UNEP/UNDP Joint Project on Environmental Law and Institutions in Africa

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PREFACE

When the global debate about environmental protection and the rational management of natural resources was ushered in by the 1972 United Nations Conference on the Human Environment, controversies erupted over the relevance of the theme to the developing countries. So furious were the arguments that some commentators characterized it as a "Third World War." The underlying argument was that environmental degradation, particularly pollution by industries which was prevalent int he economically advanced countries, was an essential component of economic growth. The forceful implication was that any movement which sought environmental protection was an anathema to the objectives of the developing countries, especially in Africa which were in dire need of development.

Part of the broader and critical questions were that environmental protection would entail additional costs to the countries and their industries . Industrialized countries were quick to ask the question as to who would bear the cost of environmental protection in the developing countries. Papers were prepared for special sessions on "additionality" during the Stockholm Conference. The other critical issue was that strict environmental regulations would scare away industries from developing countries and, therefore, stifle their development objectives.

Over the years, there has been gradual realization that environmental protection and its rational management are in fact a precondition to development. It became clear in the industrialized countries that industrial effluents where discharged as wastes were, actually, evidence of inefficient industries. The more rational goal was to reduce the wastes to be discharged in the environment and to maximize marketable output. It became similarly evident that the natural resources and the environment within which they exist actually constitute economic wealth necessary for the industrialization and well-being of the population of the developing countries. The requirement and imperative at that is that such resources should be utilized sustainably.

Within less than three years the trend in the arguments are changing fast. The corpus of environmental laws and institutions in the developing countries is growing rapidly. Several African countries have made requests to various potential donors, including the United Nations System for financial support and technical assistance, to facilitate development and enforcement of their environmental laws as well as implementation of policies and obligations assumed under conventions and agreements. So the trend towards greater acceptance and respect for environmental law is changing rather fast and on a global scale. What has been unclear is the extent to which industry and the private sector generally accept to promote compliance with and enforcement of environmental law.

This volume presents the actual presentations by representatives of industries from ten African countries on the question of rational management of the environment and natural resources. Among them were representatives of chambers of commerce and industries; federations of employers; specific industries, including multinationals; and government representatives.

During the preparations for the Workshop there had been considerable uncertainty as to whether the industrialists would be enthusiastic about the theme of the workshop. Even less certain was whether they would be keen to adopt any recommendations for future action. Ultimately, the level of discussion and the determination to promote compliance with environmental law by industries was impressive. The recommendations which appear here are presented in their raw form and, therefore, rather mixed and, at time imprecise. On the other hand, they present clear testimony of the commitment to principles well beyond the original expectations and demonstrate Africa's ability and deter-mination to move ahead in championing sustainable development as the best strategy in the new millennium.

OPENING REMARKS

By Mr. Donald Kaniaru
Director, Environmental Law and Institutions Programme Activity Center

On behalf of the United Nations Environment Programme, and of my colleagues, I welcome you all, particularly those who have come to Kenya, and to Kisumu, for the first time.

Kisumu, the third biggest city in Kenya, gained momentum at the beginning of this century when the railway reached here from Mombasa, Kenya's second largest city. Situated on the shores of the biggest fresh-water lake in Africa, Lake Victoria, and at the heart of a well watered region of the country, Kisumu is also home to much of Kenya's intellect, a fact of which the Task Manager is living testimony. It is also an example of industrial development away from the capital city, Nairobi.

Approaching it from Nairobi, you have a feel of Kenya, its gorgeous mountainous country side, rolling plains and valleys, and a thriving mix of peoples. When you later visit Western Kenya, you will get further confirmation of the beauty of the land, and the diversity of its cultures, and its potential. I wish you well.

A word about UNEP. UNEP was established following the United Nations Conference on the Human Environment which was held in Stockholm in 1972. It was located in Nairobi, Kenya, effectively from 1st January 1973, making it the first, and to date the only, global body of the United Nations to be located in a third world country, outside the traditional United Nations centers in North America and Western Europe. On 15 December 1997, UNEP will reach 25 years, and you may wish, in advance, to congratulate the Organization.

UNEP's mandate is the coordination of environmental action and to be a catalyst to others, particularly Governments and other United Nations organizations. It comprises a Governing Council of 58 Member States of the United Nations; a core Secretariat headed by an Executive Director; and an Environment Fund that is voluntarily funded. Its activities include programmes on Environmental Assessment, Environmental Management; Industry and Environment; Environmental Law and Institutions (ELI/PAC); Land use — including forestry, soils, and water; and Freshwater and Oceans.

UNEP has offices overseeing environmental activities in the different regions of the world: Africa; West Asia; Asia and the Pacific; Latin America and the Caribbean; and Europe and North America. In addition, it has responsibility over five global Convention Secretariats; CITES, Convention on Migratory Species, Basel Convention on Hazardous Wastes, Bio-diversity and Ozone. It also has responsibility over several regional seas conventions as well as the Lusaka Agreement. UNEP's other offices include UNEP Chemicals, previously known as the International Register of Potentially Toxic Chemicals (IRPTC), and the Economic and Trade Unit, among others. Hopefully, you have come into contact with the work of at least some of them, whether in the form of training or of books and reports. Our own ELI/PAC's published materials include the *Biannual Environmental Law Bulletins, The Register of International Treaties, UNEP's New Way Forward, The Handbook on Environmental Law, Training Manual on Environmental Law, The Compendium on Environmental Legislation in Africa* (three volumes already available to you and another three volumes under publication), a number of soft law instruments, such as EIA Guidelines. Additionally, a number of new global instruments are under way. Two examples are the forthcoming conventions on Prior Informed Consent (PIC) and on Persistent Organic Pollutants (POPs), both of which have important implications for industry.

In its 25 year life UNEP has served as the environmental conscience of the United Nations system. Environmental awareness is more than ever taken for granted. Altogether, over 140 countries have national environmental departments,

Commissions and so on, and a countless number of NGOs, a feature previously unknown.

For our meeting, your host is the Environmental Law and Institutions Programme Activity Center (ELI/PAC), the unit responsible for the UNEP/UNDP/Dutch funded project on Environmental Law and Institutions in Africa which has been in operation since late 1994. Environmental work stretches from the inception of UNEP. Since then development of international environmental law has resulted in several global and regional binding instruments, and numerous soft law instruments. Our assistance to developing countries, and recently, to countries whose economies are in transition, has reached over 90 countries. Assistance has been in the following areas: (i) development of national legislation and policies; (ii) review of the functioning and coordination of institutions dealing with environment; (iii) implementation of international instruments; and (iv) training and exchange of environmental information.

Two other UNEP offices, Industry and Environment Programme Activity Center and Regional Office for Africa are interested in your work and are aware you are for the next few days reviewing the subject under consideration.

Under the Dutch funded Project just referred to, to which we are immensely grateful, we have set up serious environmental law review work, training and capacity building of personnel and institutions in the project countries, ie Kenya, Uganda, Tanzania, Malawi, Mozambique, Sao Tome and Principe, Burkina Faso and the Republic of South Africa (in which the work has so far been less intense). Other countries have benefitted from selected activities. They include Zambia, Ghana, Niger, the three other Portuguese speaking countries (Angola, Cape Verde and Guinea Bissau), Mauritania, Morocco, Madagascar, Lesotho, Swaziland, Ethiopia. The funding for this has come from ELI/PAC, the clearing house of UNEP, and UNIDO — which is still supporting some participants here, and to whom we are equally grateful.

Under the project we have systematically taken initiatives with lawyers and policy makers, including judicial officers and practicing lawyers, through national and regional workshops on a range of national policy and environmental issues and on Conventions. The present Workshop extends this initiative to a key sector in national economies, industry. We in ELI/PAC have not, save for the Code of Ethics that we have shared with you, specially gone to industry in our work till now although our work does have an impact on industry. Our colleagues may have, but this does not fully take our place, because the issues we could and will take up with you can only be handled by lawyers and yourselves. Given our experience and our role in the negotiations that have led to many of the global and regional agreements in force in your countries, and in advising Governments on many environmental laws, there is much of common interest between industry and us which we shall explore during the next few days and well into the future.

I recognize that UNEP is not the only United Nations organ involved, actually or potentially, with industry. There are others: UNIDO, UNCTAD, WIPO, IMO, WTO, UNCTC and, depending on the subject, a Regional Economic Commission or other specialized agencies like the FAO. We are not duplicating such interaction as ours is a differently focused intervention. If I have gauged this wrong, I will be glad to hear from the Resource Persons and you, senior staff, in Industry.

I am not called upon to address the issues before us. Indeed I have little knowledge of industry apart from some knowledge of company law, the law of partnerships, commercial law, contract and tort law. As such I possibly do not qualify to say more than this. Nevertheless, being the citizen of a country where I have knowledge of the policies and laws of the land, and where a variety of industry activities have an impact on my life and on broader aspects of the environment from which I cannot exclude myself, or abdicate a measure of responsibility, I believe I could quickly say a few words.

First, the Task Manager kindly shared with me three papers and some background papers that were ready as of the time I went to Beijing on 16 November 1997. I found these papers substantive and they whetted my appetite to hear or read more, which this workshop will facilitate. I am assured that the other papers are of similar substance. I should therefore not sit on the fence. Similarly, each of you should feel free to speak frankly particularly in those situations where you feel the view you express is your perception of the issue. Only if this is done across the board would such a meeting be really useful. After all you have responsibility well beyond your company to society at large and to future generations. With such views you may be able to persuade your establishment to look at certain issues differently in a positive sense - which in itself may be in the

long term interests of the Company. There is, after all, interdependence not only within people and States, but within industry as well.

Second, I recognize that those present represent a mixed bag of companies and industries. That, however, is only true if we examine minute details which we will not be able to do in a three day meeting. Broad operations, and the considerations of environmental concerns and responsibility do not fundamentally differ even though the type of environmental impact, its magnitude and the nature of the receiving environment actually differ depending on industry (say mining, oil, chemicals, processing or manufacturing, marketing and so on). At least this is the impression I got from the papers I read, and from other general readings. As we know, companies operate under the Companies Act, applying diverse articles and memoranda of association. But in practice there is no difference between companies in the application of fundamental principles which are increasingly accepted as part of international law and, in many countries, national law? These principles include:

- the polluter pays principle;
- the precautionary principle;
- efforts towards achieving sustainable development, and inter generational equity;
- right to environmental information, and open public participation and accountability;

Consequently, the concerns which we will broadly address will be worthwhile irrespective of the type of industry that has an impact on the environment.

Third, I underline that we at UNEP have no particular ties with any of the companies and industries represented here, and had no role in the selection of any of the participants. We selected the resource persons but they express their expert views, and not those of either their institutions — unless they so indicate — or those of UNEP. Equally we are not canvassing any position, for industry, Government or NGO.

Fourth, in my view, representatives of industry, like many other like-minded stakeholders in our country, do not necessarily enter into dialogue with each other, or interact with industry in different countries. In some countries once one is employed in one company, one does not no shift until one leaves the company on retirement or death. In our countries, which are developing, there is much to learn from each other, and consequently a meeting like this is of crucial importance and a sensible pointer to the future. In this instance you will not only learn from each other, you will also be updated on current developments internationally and within the region.

Fifth, I believe, and many in society do likewise, that for years in our countries industrial development has been equated, rightly or wrongly, with such perceptions as indicators of growth and development — irrespective of ensuing consequences e.g. pollution and health risks. Development is associated with creation of wealth and with much needed employment. Often foreign investment in industry is protected by the Government, and profits can be repatriated under the laws of the country. Where the particular industry is an offshoot of a metropolitan company, possible advantages in locating in a developing country is lower standards, regulations or laws, low wages, cheap raw materials easily acquired without corresponding duties. However, should double standards be encouraged, only because the developing countries have not promulgated the laws, regulations and standards, and because they have no means to monitor or follow-up closely the activities of a company?.

Sixth, depending on where the industry is located, the question of benefits to society is important. What, if any, is **industry's social responsibility?** Is it that beyond paying taxes to the Government which is applied as Government sees fit, there is no further social responsibility? It is common knowledge that corruption is practiced, or appointments are made with targeted and directed benefits in mind, but why sanction such undercover operations instead of open social responsibility, a contribution that can serve society at large? Do such appointments bring in ill-qualified people, or people whose contracts are subject to other pressures - e.g. work permits? Or is it that industry is unaware of its social responsibility? In Kenya, in the field of wildlife management, the organ concerned, the KWS, has concluded that, in its relations with communities co-existing with animals, it must share benefits with the communities and has put up schools, dispensaries and so on. Is this, in principle, any different from what industry could expand upon? In the West, University research is heavily supported by industry. This is, however, practically non-existent in our countries. Why? Don't we need research? Chairs in universities could bring untold benefits to society at large In the education system, schools are moving into the technologi-

cal age with computers etc. In our countries, Governments' ability to equip schools is severally constrained. Could such initiatives not be taken up by industry as a benefit that extends beyond an individual or selected individuals to society at large?

Do not those companies that pollute and over-use public goods such as air and water owe it to society to give back some benefits to society? Should they not pay something under the "polluter pays principle" to society? Should there be a requirement that those companies with an overseas base should apply the same standards in the developing world as in their home countries? Why export pollution to poor countries and, most important, why should the developing countries accept this? Is this benevolence or exploitation? Apart from this, should not standards and regulations apply to all companies in the country? Should industry in our countries not be part of solving contradictions in our policies and laws?

Seventh, is industry aware of the changes in policy and law that are being introduced in many developing countries? Following the Earth Summit in Rio de Janeiro in June 1992, Governments adopted policy measures that mark a complete break from the past, and that called on States to introduce effective legislation to effect those policies and to examine existing laws with a view to achieving that result. What measures, if industry is collectively and individually aware, have they taken, or are they taking, to adjust to, or to introduce, changes that would meet desired standards? They cannot afford to disregard this except to their total detriment.

It is to be noted that all our countries adopted Agenda 21, and cannot fail to act as, by and large, some of the instruments adopted require legislation and bind our countries. This is the case with the Convention on Bio-diversity and the Convention on Climate Change as well as the Rio Principles, many increasingly adopted as part of national law in our countries and in other countries as well, for instance France, India, Philippines, Pakistan, to name but a few. At the same time EIA has become a requirement in many countries including our countries.

What measures or incentives would you require of your country to upgrade your equipment, or improve on the efficiency of the delivery of your industry? Each industry should determine and review with the concerned Government these issues. Easy measures, such as frightening professionals not to apply the laws, regulations or standards of the country, will not buy industry time indefinitely. After all industry should be aware that such officials and the company itself may, in many countries, be sued by a member of the public under emerging laws which allow such suits without the need to show specific interest or personal injury. Is industry prepared for such eventualities? Countries are not standing idly by. For example, applying the law, between June 1996 and August 1997, China suspended or closed 60,000 enterprises that have polluted their environment, a drastic measure for a country with a lot of unemployment. The Indian Supreme Court has ordered the closure of industries, even if this was to result in unemployment, or relocation of industries while at the same time continuing to pay workers till remedial measures are carried out. I wonder whether this should not be pondered most carefully in our countries.

Would not the public right to environmental information further break the cloak of secrecy that industry has hitherto enjoyed? In the long run, complicated expert evidence presented in court will not save industry. Consequently, industry must be part of dialogue, and wider public education and environmental awareness.

Industry in our countries may not be active in environmental debate and the adjustment of its technology, production and delivery packages. This is, however, not the case in the developed world, and in instances,in the developing world for industry with international operations which have read the signs of the times. For example Proctor and Gamble, in P & G Environmental Progress Update (1997), page 6, discussing sustainable development, and noting debate on its meaning observed that "there is emerging consensus that sees a path towards sustainability balancing three things, economic development, environmental stewardship and social responsibility." It added: "Our perspective is that the quality of people's lives in all parts of the world can and should be improved continuously, and environmental quality is one element of such improvement.

Today, we judge our products, packages and operations against four criteria as a guide to sustainability:

- They must be safe for workers, consumers and the environment.

- They must meet the letter and spirit of the law. Compliance is a key factor in all our operations, though we commonly do more than what is required.

- They must use resources wisely and minimize waste. This makes economic and environmental sense.

- They must improve the quality of people's lives and must address our stakeholders' needs and concerns."

These sentiments are clearly laudable and forward looking and the best test is application in practice.

One executive of a United Kingdom based company stated unequivocally, "a successful company is problem solving." Does your company share this, and apply it in its relations with the environment?

With the above in mind, I look forward to an exhilarating meeting in the next few days. I apologize for exposing my ignorance to experts. I thank you all for listening to me.

SPEECH

Mrs M.W. Githinji, EBS,

Permanent Secretary, Ministry of Commerce and Industry, Kenya

The Task Manager, UNEPE/UNDP Joint Project on Environmental Law and Institutions in Africa, Prof. C.O. Okidi; the United Nations Development Programme (UNDP) Representative; The Royal Netherlands Government Representative; the Director, UNEP Environmental Law Unit, Mr. Donald Kaniaru; distinguished members of the academic staff; resource persons, industrialists, ladies and gentlemen.

I am delighted to be invited to officiate at the opening of this important workshop on Industries and environmental law in Africa. I am indeed encouraged to note that the workshop deliberately and specifically addressed industries, which are the main culprits with regard to industrial effluents and, more so because industrial effluents and, more so because industrialisation will be the emphasis on our national development agenda for the next 25 years.

Ladies and Gentlemen, I hope you will agree with me that civilization is rooted in nature. Nature has shaped human culture and influenced all artistic and scientific achievements. Hence living in harmony with nature gives man the best opportunities for the development of his creativity, and for rest and recreation.

Every form of life is unique, warranting respect regardless of its worth to man, and, to accord other organisms such recognition, man must be guided by a moral code of action. In our times man's capability to transform his surroundings, if used wisely, can bring to all peoples the benefits of development and the opportunity to enhance the quality of life. Wrongly or heedlessly applied, the same power can do incalculable harm to human beings and the human environment.

We see around us growing evidence of man-made harm in many regions of the earth: dangerous levels of pollution in water, air and soil; major undesirable disturbances to the ecological balance of the biosphere; destruction and depletion of irreplaceable resources; and gross deficiences, harmful to the physical, mental and social health of man, in the man-made environment, particularly in the living and working environment.

In the developing countries most of the environment problems are caused by under-development. Millions continue to live in conditions of extreme deprivation, far below the minimum levels required for decent human existence - lacking in adequate food and clothing, shelter and education, health and sanitation. In the industrialized countries, environmental problems are generally related to industrialization and technological development.

One of the greatest challenges of humanity is to forge and respect the interdependence between development and environment. The natural growth of population continuously presents problems for the preservation of the environment, and adequate policies and measures should be adopted, as appropriate, to face these problems. Of all resources in the world, people are the most precious. It is the people that propel social progress, create social wealth, develop science and technology and, through their hard work, continuously transform the human environment. Along the social progress and the advance of production, science and technology, the capability of man to improve the environment increases with each passing day.

To achieve this environmental goal will demand the acceptance of responsibility by citizens and communities and by enterprises and institutions at every level, all sharing equitably in common efforts. A point has been reached in history when we must shape our actions throughout the world with a more product care for their environmental consequences. Individuals in all walks of life as well as organizations in many fields, by

their values and the sum of their actions, will shape the world environment of the future. Local and national governments will bear the greatest burden for large-scale environmental policy and action within their jurisdictions.

International co-operation is also needed in order to raise resources to support the developing countries in carrying out their responsibilities in this field. A growing class of environmental problems, because they are regional or global in extent or because they affect the common international realm, will require extensive co-operation among nations and action by international organizations in the common interest. This requires Governments and peoples to exert common efforts for the preservation and improvement of the human environment, for the benefit of all the people and for their posterity.

The non-renewable resources of the earth must be employed in such a way as to guard against the danger of their future exhaustion and to ensure that benefits from such employment are shared by all mankind. The lasting benefits from nature depend upon the maintenance of essential ecological processes like support systems, upon the diversity of life forms, which are jeopardized through excessive exploitation and habitat destruction by man.

The degradation of natural systems owing to excessive consumption and misuse of natural resources, as well as failure to establish an economic order among peoples and among states, leads to the breakdown of economic, social and political framework of civilization intellectual or humanitarian character.

The genetic viability on the earth should also not be compromised, the population levels of all life forms, wild and domesticated, must be at least sufficient for their survival, and to this end necessary habitats must be safeguarded.

Nature must be respected and secured against degradation caused by warfare or other hostile activities. The discharge of toxic substances or of other substances into natural systems and the release of heat, in such quantities or concentrations as to exceed the capacity of the environment to render them harmless, must be halted in order to ensure that serious or irreversible damage is not inflicted upon ecosystems. The just struggle of the peoples of all countries against pollution should be supported.

In order to achieve a more rational management of resources and thus to improve the environment, states should adopt an integrated and co-ordinated approach to their development planning so as to ensure that development is compatible with the need to protect and improve environment for the benefit of their populations.

Demographic policies which are without prejudice to basic human rights and which are deemed appropriate by the Governments concerned should be applied in those regions where the rate of population growth or excessive population concentrations are likely to have adverse effects on the environment and impede development.

Scientific research and development in the context of environmental problems, both national and multi-national, must be promoted in all countries, especially the developing countries. In this connection, the free flow of up-to-date scientific information and transfer of experience must be supported and assisted, to facilitate the solution of environmental problems; environmental technologies should be made available to all countries without occasioning an economic burden on the developing countries.

Ladies and Gentlemen, it is regretable that despite genuine effort by the international community to protect environment, the global environment has continued to witness increasing amounts of pollutants being generated, culminating in a general climate change. The Kenyan government recognizes the need to arrest this trend and has integrated environmental conservation ethics in our planning for economic development.

Every industrial project will be required, by law, to provide an environmental impact statement before licensing and implementation. Potentially damaging proposals will be identified early in the project cycle, at pre-feasibility stage, and projects which are shown, by preliminary screening, as likely to have significant adverse environmental, social and economic impacts will be required to complete an Environmental Impact Assessment (EIA). The EIA will be conducted independently of the agent, department of government or the private organization undertaking a project.

Existing industries and those that had previously undergone an EIA must be periodically subjected to environmental accounting and auditing. The impact of each individual project will be internalized during appraisal and analysis,

including all the costs and benefits and in making choices on appropriate technologies, economic size and project location.

Existing legislation has been reviewed and new laws are being incorporated so that those firms and individuals who cause environmental degradation can be subjected to deterrent punishments. The laws needed for environmental protection will be protective to the environment and no just reactive to damage occasioned to the environment. Currently the law on environment does address itself to liability and compensation for the victims of pollution and other environmental damage. Firms will be provided with environmental impact guidelines to enable them undertake their own self assessments. Environmental management capacity within each project will be enhanced through the establishment of cleaner production centres and other relevant training facilities. The Government will also set standards for the appropriate disposal of wastes.

Every technology imported or developed locally has to be environmentally sensitive and must include waste management as a package. There will, also, be need for alternative technologies to ensure that industrial development is environment friendly. Central to this must be encouragement of low or non-waste technologies.

There will also be need to support a strong "R&D" programme to develop waste management techniques. A method of charging for pollution will be formulated and implemented, and will cover both the quality and quantity of effluents. Each polluter will have to pay for his load pollutant on the basis of *"Polluter Pay Principle"*. The cost of conservation and clean up shall be borne by the responsible industry or project. In this regard capacity will be developed to set, monitor, and enforce environmental quality standards. The enforcement machinery will also provide for the restoration or mitigation of environmental damage.

For Kenyan products to be readily accepted in international markets, they will have to be of high quality and conform to international standards. Among such requirements is compliance with the internationally recognized *"Quality Management Standards"* under the ISO 14000 series.

Ladies and Gentlemen, you will no doubt agree with me that increased environmental protection and prudent natural resources management are the crucial starting points for securing sustainable development. Both issues are the centre of the new global agenda as adopted in the 1992 Earth Summit in Rio where Kenya fully participated and signed the various protocols demonstrating her commitment to pursuing development policies geared towards attainment of development that is ecologically, economically and environmentally sustainable.

In order for Kenya to realise the ideals, the government will institutionalize the environmental policy making process by strengthening the various organizations involved in implementing the environmental policy and enforcement, so that progress is made on environmental issues as pertains to pollution abatement; waste management; drinking water supply, and waste water management. The ongoing national environmental action plan (NEAP) will translate broad environmental concerns into specific action plans and identify policy measures and investment priorities through:-

- preparation of national and local plans to reduce industrial and other pollution, including the setting of health and environmental quality standards for air, water, noise and marine pollution; and

- planning and implementation of a national awareness programmes on the management of waste waters from industrial and agricultural activities to inculcate appropriate attitudes and values and capabilities necessary for positive environmental action.

In concluding my remarks this morning, Ladies and Gentlemen, I should point out that this workshop is a rare opportunity for you to make workable proposals on the path of development that Kenya should follow in her quest for industrialization while taking into consideration environmental and economic sustainability for ourselves and our offsprints. May I also take this opportunity to assure you on behalf of the Kenya Government that your recommendations will be fully taken into account as we implement Kenya's industrial transformation programme in the next millennium. It is now my pleasure to declare this workshop on industries and environmental law in Africa officially open.

Thank you for your attention.

IMPACT OF INDUSTRIES ON THE ENVIRONMENT

Professor Shem O. Wandiga
University of Nairobi

1. INTRODUCTION

From the beginning man has made efforts to transform raw materials into goods for services and comfort. The process of raw materials transformation has today become a major industry that drives the lives of people and creates wealth for nations. A thriving and vibrant industry is a prerequisite in every nation for provision of goods and services, employment, and sustained economy.

The demand by industry for raw materials, and the uncontrolled wastage associated with production, have become unsustainable.

TABLE 1

a)

Yearly U.S. Consumption of Selected Ores and Commodities, 1990

Petroleum feedstock	**(Million metric tones)**
Bauxite	1.3
Phosphate	12.0
Salt	5.3
Potash	40.6
Industrial Sand and gravel	5.5
Iron ore	24.8
Plastic from Petroleum feedstock	76.9
Fibers from petroleum feedstock	25.4
Aluminium	5.3
Copper	2.2
Iron and Steel	17.7
Nitrogen	14.9
Cement	81.3

b)

Yearly Disposal of Wastes by U.S. Industries Raw materials	**In billion metric tons**
Extraction Processes wastes	2.7
Solid waste from metal mineral processes	6.9
Gas and liquid pollutants emission	7.7
Carbon Dioxide Emission	0.12
	4.9

Source: World Resources, 1994 - 1995 UNDP

Industrial processes alter natural raw materials either during the stage of extraction or of the production of final product. The by-products of industrial processes are often disposed off into the environment as wastes. The disposal of certain wastes such as toxic heavy metals, toxic organic compounds and toxic gases have far exceeded the release of these substances by natural processes. Table 1 gives the consumption of natural resources and the disposal of wastes by United States industries alone. These exceed by far the combined consumption and disposal activities of all African countries put together.

Table 2 presents data for the estimated annual global emissions of toxic metals in 1980. Human activity is today the greatest source of releases of toxic metals into the environment when compared to natural sources. Both Tables 1 and 2 show a trend which is very worrying and which has arisen from consumptive patterns of behaviour and the disposal of wastes arising from consumption activities.

This paper examines industrial processing activities, industrial products, and industrial wastes. It further analyzes the effects of increased concentrations of toxic substances on human health and the environment. Data for East African countries are analyzed to predict the future trends in environmental quality and the implications of this for human health, flora and fauna, and natural resources.

2. OUR EAST AFRICAN HERITAGE

As indicated, the eight East African and Indian Ocean countries listed in Table 3 have a combined land area of slightly over 600 million hectares. About 23.2% of this area was covered with forests and woodlands in 1993. Only 12.5% of this land mass was considered arable in that year. Another 7.3% of the land mass was under irrigation. Thus, a very large portion of the land mass was considered unsuitable for agricultural purposes. Of this, some fraction was permanently under water. As Table 3 indicates, the forest areas were being deforested at an average annual rate of 1.0% per year. Deforestation arises from demand for new land for human settlement, wood for industry, agriculture, energy, and pasture.

TABLE 2: Estimated Annual Global Emissions of Toxic metals, 1980

Human Activity		Natural Activity	Ratio of Human to Natural Activity
Metals	**Thousand Metric tons**		
Lead	2.000	6	333
Zinc	840	36	23
Copper	260	19	14
Vanadium	210	65	3
Nickel	98	28	4
Chromium	94	58	2
Arsenic	78	21	4
Antimony	38	1	38
Selenium	14	3	5
Cadmium	6	0	20

Sources: James N. Galloway, J. David Thompson, Stephen A. Norton, et.al.
"Trace metals in Atmospheric Deposition: A Review and Assessment" Atmospheric Environment, Vol.16 No. 7 (1992) p.1678.

Country	Land Area (ha) 1993	Forest and Woodland (as % of Land area 1993)	Arable land (as % of arable land area (1993)	Deforestation (1,000 ha) per year 1980-90	Production of fuel wood and charcoal (1,000 m^3 per year 1979–81)	Internal re-renewable water resources per capita (1000 m^3)	Ann				
Kenya	58.037	28.9	6.9	1.7	39	1.7	10	23.406	0.6	7	50
Tanzania	94.507	35.4	3.2	5.0	130	0.3	9	36.710	2.7	1	36
Uganda	23.588	23.3	21.4	0.2	50	0.8	2	21.953	3.5	"	20
Sudan	250.581	17.7	5.1	15.1	504	1.1	13	33.963	1.1	14	1.09
Ethiopia	110.076	22.7	10.9	1.6	88	0.3	10	9.197	2.1	2	2
Somalia	63.766	25.1	1.6	18.0	14	0.1	1	13.500	1.3	7	49
Mauritius	204	21.6	49.0	17.0	(.)	3.3	(.)	15.335	2.0	16	119
Seychelles	45	11.6	2.2					22.488			410
								32.085			15
								45.254			
								6.302			
								8.939			
								24			
								2			
Total	600,806	23.2a	12.5a	7.3a		1.0a					

Notes data not available
( ) Less than half unit shown
(a) Averages of figures given

Source: Human Development Report 1996, UNDP

TABLE 4 DEMOGRAPHIC PROFILES OF EAST AFRICAN COUNTRIES

Country	Estimated Population			Annual Population		Population doubling rate
	1960	1993	2000 1993	1966-1993	1993-2000	(at current growth rate 1993)
Mauritius	0.7	1.1	1.2	1.5	1.1	2055
Seychelles	(.)	0.1	0.1	1.6	1.0	2065
Kenya	8.3	26.4	32.6	3.6	3.1	2016
Sudan	11.2	26.6	32.1	2.7	2.7	2019
Tanzania	10.2	28.0	34.1	3.1	2.8	2016
Uganda	6.6	19.9	24.6	3.4	3.1	2016
Ethiopia	22.8	51.9	63.8	2.5	3.0	2016
Somalia	3.8	9.0	10.8	2.6	2.7	2019

Note: (.) Less than half the unit sown

Source: Human Development Report 1996, UNDP

These demands will continue into the next century. As Table 4 shows, the present population of 163 million people is growing at an average rate of 2.4% and will double around 2017.

The economies of these countries are mainly dependent on agriculture (see Table 5) with industry contributing only about 18.3% of the GDP. Given the poor natural resources base, it is expected that the economies will in future shift more to industrial and services sectors. As this happens, more raw materials will be imported to satisfy industrial demands unless economically viable raw materials for extraction are discovered in the future.

TABLE 5: SELECTED CONTRIBUTION FOR SELECTED COUNTRIES IN EASTERN AFRICA, 1992

Country	Sector		Contribution
	Agriculture	Industry	Service, etc
Tanzania	61	12	26
Uganda	57	11	32
Ethiopia	48	13	39
Rwanda	41	22	37
Sudan	34	17	50
Kenya	27	19	54
Mauritius	11	33	56
Seychelles	6	18	76

Most of the East African countries already experience water scarcity. Future shifts to industry will be impeded by a lack of water and this is likely to lead to the introduction of strict water quality legislation.

At present, East African countries have few known significant quantities of raw materials that can be extracted for economic purposes. In 1993 only one East African country had a real GDP per capita (in purchasing power parity) of over US $ 10,000 (Table 6). In comparison with developed or newly industrialized countries, all East African countries may be classified as poor. They have on average a heavy debt burden (116.2%) as a percentage of their GNP. An average 41.6% of their exports were used to service their debt in 1993.

Agricultural crops were grown on an average 5,791,000 hectares in 1991 (Table 7). This translates to an average 0.23 hectares per capita, which is below the Africa and world averages. While the world used an average of 96 kilograms of fertilizer per hectare, Africa's average was a mere 20 kg during the period 1989 - 91. The average for the East African countries was better than the Africa average and stood at 50 kg. However, if one ignores the two odd countries with high fertilizer use (Kenya and Mauritius), the average drops to 6 kg fertilizer per hectare. Given the poor soil nutrients available in most croplands within the region, it is thought that the development of agriculture to increase crop yield will need to rely increasingly on intensified use of fertilizer and other agro-chemicals.

WEALTH AND RESOURCE FLOW IMBALANCES OF EAST AFRICAN COUNTRIES

Country	Real GDP Per capita (ppp $) 1993	GNP per capita (US $) 1993	Total Debt (US $)	As % of GNP 1993	Debt Service Ratio (debt service as % of exports goods and services		Export/Import Ratio (export as % of exports) 1993
Mauritius	12.510	3.030	1.0	30	9	6	67
Seychelles	4.960	6.280	...	...	...	...	...
Kenya	1.400	270	7.0	106	21	28	80
Tanzania	630	90	7.5	301	26	21	28
Sudan	...	...	...	...	...	...	...
Uganda	1.650	430	3.1	90	17	144	35
Ethiopia	420	100	4.7	54	7	9	25
Somalia	...	...	...	...	...	...	...

Note: In Data not available $) purchasing power parity rates in US dollars

Sources: Human Development Report 1996, UNDP

TABLE 7: EAST AFRICAN COUNTRIES AGRICULTURAL INPUTS, 1979-91

Cropland		Irrigated Land			Average Annual	
	Total (000)	Hectares per capita	as a % age of crop-land		Fertilizer use (kilograms per hectare of corp-land)	
Country	1991	1991	1979-81	1989-91	1979-81	1989-91
World	1,4441,57 3	0.27	15	17	81	96
Africa	181,620	0.27	6	6	18	20
Ethiopia	13,930	0.27	1	1	3	7
Kenya	2,440	0.10	2	2	27	45
Mauritius	106	0.10	15	16	237	277
Somalia	1,039	0.12	11	11	1	2
Sudan	12,900	0.50	14	15	5	6
Tanzania	3,370	0.13	4	4	10	15
Uganda	6,750	0.37	0	0	0	0
Seychelles	x	x	x	x	x	x

(x) Not available

Source: World Resources Report, 1994 - 1995

Another poorly developed industrial sector in the East African region is the energy sector. Table 8 shows that the world commercial energy consumption stood at 321,430 petajoules (petajoules = 1015 joules) in 1991. Africa's share of this was a mere 7,871 petajoules and East Africa's commercial energy consumption in the same year was a meager 32.6 petajoules. A look at the per capita commercial energy consumption shows a graphically low figure of 3.4 gigajoules as compared to 12 for Africa and 60 for the world- see Table 8. (1 gigajoule = 109 joules).

The East African countries source of energy is predominantly traditional fuels, which includes fuel wood, charcoal, bagasse, and animal and vegetable wastes. In this area the per capita consumption in 1991 was higher than Africa's average at 8598 GJ vs 7275 GJ. The figures for traditional fuel consumption for Africa and East African countries are more than twice the world average. Over reliance on traditional fuels is bad both for industrial development and for the environment. As sources of energy they cannot drive modern industry. At the same time traditional fuels contribute as much as about 40% of both CO2 and CO emissions into the atmosphere (Helas). Therefore, the energy sector in Africa has a very big potential for growth as long as the sources of energy can be diversified.

3. EFFECTS OF MAJOR INDUSTRIES ON HUMAN HEALTH AND THE ENVIRONMENT IN EAST AFRICA

The previous section outlined the natural resources of East African countries. Three major industrial domains of activity emerge as the major driving force for the economy; namely agriculture, energy and transport. This section outlines the effects of each sector on human health and environmental quality.

TABLE 8: EAST AFRICAN COUNTRIES ENERGY CONSUMPTION, 1971 - 95

	Commercial Energy Consumption				Traditional Fuels			
	Total		Per Capita		Total		Per Capita	
	Petajoles 1991	% Change since 1971	Gigajoules 1991	% change 1971	Petajoules 1991	% Change since 1971	Gigajoules 1991	% change since
World	321,4 30	45	60	2	19,942	6	3,702	9
Africa	7,871	121	12	24	4,815	6	7,275	6
Ethiopia	40	86	1	13	414	94	8059	18
Kenya	78	84	3	(100)	9	(31)	344	99
Mauritius	16	195	15	128	17	0	15,46	(22)
Somalia	3	15	0	(37)	71	154	3	40
Sudan	47	(19)	2	(55)	220	99	8.007	9
Tanzania	29	12	1	(41)	330	157	8,490	
Uganda	15	(25)	1	(58)	137	92	12,25	7
Seychelles	x	x	x	x	x	x	9	x
							7,563	
							x	

(x) not available

Note: Traditional fuels includes estimates for fuel wood, charcoal, bagasse, and animal and vegetative wastes.

1 petajoules = (1015) joules

1 gigajoules = (109) joules

1 megajoules = (106) joules = 947.8 BTUS

Source: World resources Report, 1994.

3.1 Agro-chemicals

The major inputs for successful agriculture are fertilizers and pesticides. Major constituents of fertilizers are nitrogen (N), phosphorous (P), sulphur (S) and minerals like potassium (K) and calcium (Ca). In addition to these major constituents, fertilizers, especially phosphate ores, may contain trace metals whose concentration in excess are injurious to both human health and the environment. The same trace metals be found when sewage sludge is used as fertilizers. Therefore, the widespread application of phosphate fertilizers and sewerage sludge in agriculture land may lead to the contamination of soil and water with toxic trace metals. The effects of metals and pesticides on human health in reviewed below.

(a) **Heavy Metals:** these include mercury (Hg), cadmium (Cd), lead (Pb) and arsenic (As).

An example of mercury contamination arose in Japan where mercury (as mercuric chloride, an insoluble salt) was dumped into the Manimata Bay by chemical industries for many years. It was thought at the time that, because of its insolubility, the compound would remain in the ocean unaltered. Account was not taken of bacterial action that transforms the insoluble salt into volatile organic salts, dimethylmercury and methylmercury, two poisonous compounds which readily accumulate in fish and poison fish eaters when. Poisoned species show a fatal neurological disorder, first observed among birds, cats and fishermen living around the Minamata Bay, and now termed the Manimata disease. The subsequent legal action against industry by the victims of the disease had the effect of bringing home to industry the need to take environmental precautions in disposing of wastes.

A second example of heavy metals poisoning also occurred in Japan. For a long time the chemical industry had used cadmium in organic synthesis and electroplating. As was the case with mercury, cadmium was thought to be insoluble and was disposed of into sea. Poison occurred and the litigation by survivors of the disease forced the companies to pay large sums of money as compensation or for the clean up.

Lead poisoning has arisen mainly from leaded paints, leaded gasoline, leaded glazed pottery and water pipes. Lead poisoning may occur in children especially who may eat paint flakes or contaminated soil. High lead doses come from water transported through leaded pipes, sewage treatments or foods served in lead glazed plates. Lead is a potentially toxic substance with no physiological function. It is a central nervous system poison especially in infants exposed to a blood level greater than 27 mg/kg. (UNEP, 1992). In Kenya and East Africa, the major source of lead poisoning is leaded gasoline which spread every where by motor vehicles. Estimates (Wandiga, 1996) indicate that 66 tones of the metal is disposed of by vehicles and enter into the atmosphere, water and soil compartments of Kenya's environment each year as a result of the use of leaded gasoline.

Arsenic has been widely used as a pesticide. Today every person contains carries a amount of the metal. Arsenic is a known human carcinogen, causing lung and skin cancer. Therefore, exposure to the metal is not recommended.

The major constituents of fertilizers, namely nitrogen and phosphorus cause eutrophica-tion of the water bodies. The uncontrolled growth of water hyacinth in Lake Victoria is a result of, among other factors, the lake being enriched by these nutrients. High fertilizer use in agricultural land upstream are washed into the lake, resulting in increased nutrient input in the Lake. It is estimated that the cost of cleaning the Lake may run into billions of dollars over the coming years. This is an expense that could have been avoided if proper fertilizer use practices had been adopted.

(b) **Pesticides:** Modern agriculture depends, and will for the foreseeable future continue to depend, on pesticide chemicals for the control of diseases, pests and weeds. Pesticides, once applied, affect the ecology by killing off species, desirable ones and undesirable ones alike. Certain pesticides, known as organochlorines, have become unacceptable because of their persistence in the environment, and their bio-accumulation in biotic environments and their subsequent adverse effects on living organisms. The pesticides industry grows annually at a rate of 4.5%, with the highest potential for growth being in developing countries (UNEP, 1992).

Table 9 shows the economic value of pesticides imported into Kenya between 1986 and 1995. In 1995 Kenya imported only 53.2% of the amount it imported in 1986 (Table 10). However, the cost of import was 33.8% more than in 1986 at the prevailing shilling cost. Table 11 gives the percentage monetary value of pesticides imported into Kenya during the same period and Table 12 gives the tonnage of imports of the widely used pesticides in Kenya between 1986 and 1992 (Wandiga 1997 (b)).

TABLE 9: ECONOMIC VALUE OF PESTICIDES IMPORT INTO KENYA (1986 - 1995)
VALUE (C + F) IN MILLION KSHS

Year	Insecticides and Acaricides	herbicides	Others	Fungicides	Total
1995	707.0	312.1	74.4	682.6	776.4
1994	479.3	286.5	84.5	432.8	1283.1
1993	428.7	272.2	64.1	441.8	1206.8
1992	505.5	228.5	101.7	457.1	1292.3
1991	202.2	146.8	41.8	223,8	614.6
1990	260.3	159.4	55.6	169.2	644.5
1989	208.1	154.2	30.7	328.8	721.8
1988	158.9	145.2	28.5	329.9	662.5
1987	182.3	173.4	28.1	357.3	741.1
1986	134.9	121.3	42.6	281.3	580.1

Source: pest Control Products Board (PCPB).

TABLE 10: IMPORTATION OF DIFFERENT GROUPS OF PESTICIDES IN KENYA (1986-1995)

	QUANTITY IN TONS				
Year	Insecticides and Acaricides	herbicides	Others	Fungicides	Total
1995	1413.1	870.6	2323.0	501.9	5108.8
1994	1049.9	747.4	1671.8	563.3	4032.4
1993	839.0	882	1503	309	3533
1992	1670.0	1122	2634	1164	6590
1991	1072.0	844	1568	570	4054
1990	1572.0	134	1330	857	4993
1989	1571.0	1148	4327	665	7711
1988	1089.0	2108	4259	801	8257
1987	1206	1311	715	697	10371
1986	1076.0	112	654	808	9597

The cost of pesticides imports will continue to rise. Even worse, the environmental costs of pesticides use have not been taken into consideration. Although organochlorine pesticides have been banned in Kenya, except for use for public health purposes, the policy needs to be reviewed in line with new scientific evidence accumulating on the fate of such pesticides in tropical environments and the changing life pattern of insects (Wandiga (c) 1996).

A decline in the volume of imports is noticeable between 1988 and 1990. This was probably due to the ban and restriction on organochlorine pesticides. In 1985, Munga reported that 70 tons of DDT had been used annually for agricultural pest control on maize and cotton while other organochlorine pesticides, such as lindane, aldrin and dieldrin were used for seed dressings. DDT was last imported into Kenya in 1985, while aldrin and dieldrin were last imported in 1992. Organochlorine pesticides still in use in Kenya are endosulfan, alpha and gamma - BHC and alachlor.

Organochlorine pesticides like DDT have been proved to cause species decline especially in birds and fish (UNEP 1992, Wandiga 1996 (c)) Some are poisonous to humans. If these pesticides are able to biodegrade or if they decompose in a short period of time their effects on humans and other organisms would be minimized. Studies

TABLE 11: IMPORTATION OF DIFFERENT GROUPS OF PESTICIDES INTO KENYA (1986 - 95)

AS A PERCENTAGE OF TOTAL MONETARY VALUE OF IMPORT					
Year	Insecticides and Acaricides	Herbicides	Fungicides	Other	Total
1995	39.8	17.6	38.4	4.2	100
1994	37.4	22.3	33.7	6.6	100
1993	35.5	22.6	36.6	5.3	100
1992	39.0	17.7	35.4	7.9	100
1991	32.9	23.9	36.4	6.8	100
1990	40.4	24.7	26.3	6.6	100
1989	28.8	21.4	45.5	8.6	100
1988	24.0	21.9	49.8	4.3	100
1987	24.6	23.4	48.2	4.3	100
1986	23.2	20.99	48.6	7.3	100

Source: Pest Control Products Board (PCPB)

done in the tropics show that the half-life of these chemicals is much shorter than in the temperate regions. Evidence to this effect comes from the reported levels of organochlorine pesticides in the environment. Table 13 shows very low levels of DDT detected in fish in Kenyan lakes. These levels are much lower than those reported for temperate environments. (Wandiga 1996 (c), 1997 (b)). Lincer et al (1981) found the highest concentration of 0.4 mg/kg wet mass of p,p-DDE in muscle tissue from a single bottom feeding fish, Labeo cylindricus from Lake Baringo. Munga (1985) also found that the maximum (mean) concentration of total DDT in fish muscle samples from the Hola irrigation Scheme was 0.4 mg/kg wet mass in Clarias mossambicus which is also a bottom feeding species.

Apart from the isolated sample of *L. Cylindricus* from Lake Baringo, DDT residue levels in fish species were found to be higher in the Hola irrigation scheme than elsewhere in Kenya.

Koeman et al (1972) found DDT residue levels of 1.0 - 7.0 x 10^{-3}mg/kg wet mass in fish while Lincer et al (1981) found DDE level 1.0 x 7.0^{-3} mg/kg wet mass in fish and DDE level of 4 x 10-2mg/kg. This scientific evidence needs to be absorbed by policy makers.

IMPORTATION OF SOME PESTICIDES INTO KENYA FROM 1986-1992)				
Year	Malathion (technical) (tons)	Carbofuran (technical) (tons)	Fura (350 litre)	Carbosuffan (Marshal 250 (EC) (Litres)
1992	10.0	23.0	15,000	20,000
1991	13.0	10.0	21,000	
1990	18.5	12.0	16,000	-
1989	16.0	7.0	10,000	20,000
1988	9.0	14.0	-	-
1987	15.0	30.0	2,000	-
1986	20.00	8.0	-	-

Source: Pesticides Control Products Board (PCPB)

TABLE 13: REPORTED LEVELS OF DDT RESIDUES IN FISH FROM KENYAN LAKES

Species	Residues Concentration mg/kg wet mass	Source
Lake Baringo		
Tilapia nilotica	0.009	Lincer et at (1981)
Clarias movsambicus	0.019	
Burbus gregorii	0.028	
Labeo cylindricus	0.400	
Lake Naivasha		
Tilapis spirulus nigrax	0.001	Lincer et al (1981)
Tilapia lencosticia *Micropterus salmoids*	0.003	Lincer et al (1981)
Lake Nakuru		
Tilapia grahami	0.015	Lincer et al (1981)
Lake Victoria *Lates nilotica*	0.004	Foxall (1983)

Sources: Wandiga, 1993 (b).

Table 13 gives residue levels in fish in Kenya's inland lakes.

3.2 Energy: The East African countries energy sources are mainly biomass, imported fossil fuels, hydro-power and geothermal energy. (World Resources, 1994-95) The last two sources contribute a very small percentage of the total energy consumption. The future potential energy sources are solar, hydropower and geothermal, in that order. But though these countries could greatly benefit from solar energy, this source is still undeveloped.

TABLE 14: EAST AFRICAN COUNTRIES CO2 EMISSIONS FROM INDUSTRIAL PROCESSES, 1991

	CARBON DIOXIDE EMISSIONS (1000 METRIC TONS)					
	Solid	Liquid	Gas	Gas Flaring	Manufacture	Total
World	8,581,088	9,493,424	2,751,936	256,480	593,568 0	22,671,60
East African Countries						
Ethiopia	0	2,682	0	0	145	2,825
Kenya	355	3,745	0	0	746	4,847
Mauritius	4,785	17,243	73	0	2,093	24,197
Somalia	0	524	0	0	0	524
Sudan	0	3,320	0	0	84	3,404
Tanzania	15	1,993	0	0	149	2,158
Uganda	0	909	0	0	5	912
Seychelles	x	x	x	x	x	x

(x) Not available

Source: World Resources 1994-95. World Resources Institute.

EAST AFRICAN COUNTRIES OTHER GREENHOUSE GAS EMISSIONS, 1991

Carbon Dioxide Emissions from Land-Use change		Methan from Anthropogenic sources (100 metric tons)				chlorofluoro Carbons (000 metric tons)
World	3,40000,000	40,000	72,000	76,000	188,000	400
Africa	640,000	1,400	2,600	9,600	13,600	12
Ethiopia	8,000	54	x	1,400	1,400	x
Kenya	360	49	8	600	657	6
Mauritius	X	4	x	2	6	x
Somalia	360	23	1	63p	654	x
Sudan	38,000	47	1	1,100	1,100	x
Tanzania	21,000	79	200	520	779	x
Uganda	4,700	17	24	200	240	x
Mauritius	X	4	x	2	6	x
Seychelles	X	x	x	x	x	x

Note: X = not available

Source: World Resources Report 1994-95

No meaningful industrialization can take place without a developed energy base. There is, therefore, a big growth potential in this sector. As the sector grows, its contribution to environmental imbalances will need to be closely examined. The environmental concerns for this sector relates to the gaseous emissions generated by industrial processes.

Table 14 shows that, at present, gaseous emissions from industrial processes in East Africa, such as carbon dioxide (CO2) are low. Indeed the combined emissions of CO2 from all industrial processes amount to a mere 38,867,000 metric tons. This is only 5.8% of the Africa's total and 0.2% of global emissions. It is expected that, with industrialization, there will be an increase in CO2 emissions from industrial processes in this region.

The concern with industrial gaseous emissions relate to their warming effect of the atmosphere, described as the greenhouse effect. It is thought that the greenhouse effect will increase the global temperature by at least 1oC by 2025 (UNEP, 1992).

In addition to the major greenhouse gas, (CO_2), other greenhouse gases like methane (CH_4), carbon monoxide (CO), water vapour (H_2O), and ozone (O_3) are produced by both industrial and biological processes. Table 15 presents methane emissions from various anthropogenic sources within East African countries. As for CO_2, the emission strength of this gas is significant in the sub-region and amounts to 13.6% of Africa sources. Similarly, it is estimated that the region emits 72,420,000 metric tons of CO_2 as opposed to Africa's 620,000,000 metric tones. This arises from land-use change. Africa contributes 18.8% of CO_2 emissions of the global total from land-use change. There is a need, therefore, for Africa to reduce this emission source if it is to abide by the requirements of the United Nations Convention on Climate Change. It is further estimated that 40% of COo_2 emitted from Africa comes from biomass burning.

Much more significant is the fact that even where the region's forests are not burned its savannahs are. 40% of the CO emitted in Africa comes from cooking (Helas). The burning of vegetable stalks and wet wood with high nitrogen content contributes to the high emission of NOx gases in Africa. It has been estimated that 50% of NOx content over Africa's atmosphere comes from cooking (Helas). Both CO and NOx are very important gases in the formation or destruction

ROAD TRANSPORT DATA FOR SELECTED COUNTRIES IN EASTERN AFRICA SUB-REGION IN 1988 - 89

Country	Total road length	Road density (km per million persons	Paved road as % of total	Paved road in good condition as % of total paved road	Total number of vehicles	Total rail length (km)
Mauritius	1801	1579	93	95	43379	
Djibuti	2895	-	17	-	9000	100
Sudan	6599	98	75	27	15,000	4954
Burundi	5144	195	7	58	-	-
Rwanda	12070	149	7	41	7109	-
Madagascar	14700	475	35	56	27739	1054
Ethiopia	20563	84	20	48	39942	681
Uganda	28332	118	4	10	32155	1232
Kenya	64584	278	12	32	114,710	3034
Tanzania	81895	156	4	25	48752	3569

Note: - Data not available

Source: World Resources Report 1989: World Bank, 1994

of ozone in the troposphere and stratosphere respectively. It is for this reasons that a very high content of ozone has been measured in the troposphere in both

Southern and Western Africa (Helas, 1997, Lettre Pigbprc France, 1994). Ozone is a strong oxidant and a poisonous gas. It's high content in the troposphere could result in photochemical smog whose blooms affect adversely children, the elderly and the sick, and may cause death.

3.3. Transport The East African sub-region is characterized by a small road network and poor maintenance. The transport industry can greatly benefit from an improved road network and sustained maintenance programmes. Expenditures on road maintenance should be increased to a significant proportion of total road expenditures if traffic flows is to be enhanced. Table 16 presents data for road transport in the sub-region in 1988/89. Karekezi and Majoro (1994) have suggested that improvement of road traffic management would greatly assist mobility, accessibility and efficient fuel use. Furthermore, diversification of the road transport system would reduce its negative impact on environmental quality.

The potential for growth in air transport is highest in Africa where the industry is in its infancy. While the air traffic industry is approaching maturity in the United States and Europe, the African market is still in the transition state. It will enter the growth stage in the early decades of the next century (Netherlands 1995). Table 17 shows that by end of December, 1993 there were 382,420 registered aircrafts world wide. The turnover of airlines companies was a staggering 226% between 1984 and 1993. Air traffic grew by 9.9% between 1960 and 1990, it is projected to grow by 6% between 1992 and 2000 and 5% between 2000 and 2010. The 1960 - 1990 growth was more than double the world economic growth which stood at 3.8% between 1960 - 1992.

We have already analyzed the CO^2 emissions from all industries in the region and showed that it amounts to 3.2% of global emissions. Table 14 is a composite aggregate of all industrial emission sources and include CO^2 emissions by the fleet of vehicles given in Table 17 as well. An attempt is made below to show the significance of aircraft emissions. Table 18 gives the global aircraft emission of various gases and their share of the total emissions due to the combustion of fossil fuels (coal, petroleum and gas) in 1990. The global CO^2 emissions coming from aircrafts is in the order of Africa contribution. In general aircraft contribution to greenhouse gases is significant. Since aircraft travels often benefit two or more countries it is difficult to assign this contribution to any individual country. Furthermore, it is important to note that most aircraft emissions are either at the boundary between troposphere and stratosphere or in the stratosphere. The emissions of oxides of nitrogen (NO^2), volatile organic compounds (VOC), carbon monoxide (CO), and sulphur dioxide (SO^2) at high altitude have an adverse impact on the stratospheric ozone layer, which plays a very important protective cover against ultraviolet radiation. As the aircraft industry develops in Africa, the question to ask is how the tropical ozone layer will be affected, given the high intensity of solar radiation along equator. More research is needed to answer this question.

TABLE 17: NUMBER OF REGISTERED AIRCRAFT, CIVIL AND LIGHT AVIATION OF 31 DECEMBER, 1993 AND AIR TRANSPORT GROWTH (1984 - 1993)

Air craft Registry		Turnover of Airline Companies		
Category	**Worldwide**	**1984**	**1993**	**% Growth**
Jet-engined	18,930	105	227	226
Turboprops	14,590			
Piston-engined	328,33 0			
Helicopters	20,570			
Total	**382,420**			

Source: ICAO, 1994 and CBS, 1994

TABLE 18: AIRCRAFT EMISSIONS AND THEIR SHARE OF THE TOTAL EMISSIONS DUE TO THE COMBUSTION OF FOSSIL FUELS (COAL, PETROLEUM AND GAS) IN 1990

	CO^2 (miton)	NO^x (kton)	VOC (kton)	CO (kton)	SO^2 (kton)
Aircraft	498	1,786	406	679	156
All sources (World Total)	22,000	82,000	27,000	303,000	130,000
Percentage Attributable to Aircraft	2.3	2.2	1.5	0.2	0.1

Source: RIVM, 1995

Finally, traffic generate noise. With increasing fleet of vehicles and aircrafts, most cities are becoming increasingly noisy. It is generally accepted that noise with an intensity above 42 db may harm hearing. Vehicles and aircraft may generate sound whose intensity may exceed 42-120 db. Most developed countries have formulated policies on traffic noise. The formulation of laws regulating traffic noise pollution in the region needs to be undertaken to complement the existing laws regulating factory noise pollution.

IV. CONCLUSION

The eight East African countries studied are not very well endowed with natural resources. They have fast growing populations with slow economic growth. They rely mainly on agriculture and to a lesser extent on industry and the services sector. Major impacts on the environment arise from agro-chemicals, energy and transport activities. Presently, chemical emissions into the environment are low but there is potential for these to grow as industrialization picks up. Industrial growth will be limited by the lack of water resources and energy production capacity.

Shortages of water resources experienced by most of East African countries will be exacerbated by restrictions imposed on industry by way of legislation and international pressure. These may lead to the creation of trade barriers, more stringent legislation and refusal by external and internal investors to fund any project that is not sensitive to protecting water resources. Furthermore, civil actions will increase against industries that harm human health and the environment.

Development of alternative transport systems and exploitation of renewable energy source hold great potential in the Region as areas of investment in the future.

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LAW AND SUSTAINABLE INDUSTRIAL DEVELOPMENT

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1. INTRODUCTION

The United Nations Conference on Environment and Development (UNCED) in its Agenda 21 recognized the importance of Business and Industry in the management of the environment. It stated:

> **"Business and Industry including transnational corporations should recognize environmental management as among the highest corporate priorities and as a key determinant to sustainable development."**

Earlier, the World Commission on Environment and Development (WCED) in their 1987 report, "Our Common Future", had, in a chapter titled, "Producing More with Less,[1] discussed the concept of sustainable industrial development. This title was an apt description of the aspiration of the international community to change course over an issue which had, for over four hundred years, been characterized by the near total disregard of the environmental consequences of industrial policies which aimed to maximize output at all costs.

The aspiration to achieve sustainable industrial development has implications for the legal and institutional framework for environmental management. The general theme of the WCED report was "Our Common Future", which implies a "common world".[2] Whether the aspiration to achieve sustainable industrial development augurs well for our 'common world' must be set against the reality that, in a continent like Africa, extreme poverty is explained partly by the absence of industrialization.

This paper looks at the achievement of sustainable industrial development as an aspiration of mankind. It places that aspiration in the context of the international debate on environment and development which has raged since the 1972 Stockholm Conference and the responses of the international community to that debate. The paper makes tentative suggestions as to how the aspiration may be achieved in Africa through appropriate legal and institutional frameworks.

2. THE CONCEPT OF SUSTAINABLE INDUSTRIAL DEVELOPMENT

A definition of sustainable industrial development must begin with a definition of the wider and more general concept of sustainable development. Sustainable development was popularized by the WCED report which defined it as:

> **"development that meets the needs of the present without compromising the ability of future generations to meet their own needs".[3]**

Sustainable development has two key concepts; the concept of needs whereby development serves human needs especially the needs of the world's poor, and the concept of limitations to development imposed by the state of technology and social organization to ensure that future human needs can be met.[4] The concept also incorporates, as a key component, the need to have both inter- and intra-generational equity.[5]

Sustainable industrial development is the application of the general concept of sustainable development to a particular sector, industry. To be sustainable, industrial development must fulfil a number of criteria. First, it must be environmentally sound, ie, not lead to deleterious effects on the environment. Secondly, it has to be so managed that the needs of the present and fu-

ture generations are met. This requires sound economic policies which take into account efficiency, environmental concerns, and social equity concerns. As Dr. Tolba, then Executive Director of UNEP stated:

> **"Equity and efficiency are the foundations upon which sustained and environmentally sound economic development will emerge. A pivotal challenge to industry is to redefine planning horizons whereby the consequences of economic decisions are calculated in terms of both short- and long-term environmental impacts. Sustainable development and inter-generational equity seek to extend economic horizons beyond short-term investment horizons to take into account the well being of our descendants".[6]**

This point had earlier been stated by WCED in its definition of strategies for the achievement of sustainable industrial development.[7] These strategies include:

(1) The establishment of environmental goals, regulations, incentives and standards at the national and international levels as benchmarks for environmental conservation and for dealing with the impacts of industry upon the environment.

(2) The use of economic instruments such as incentives and dis-incentives, including taxation and resource pricing policies, as a means of controlling the environmentally deleterious effects of industry.

(3) Broadening the use of environmental impact assessment of projects, products, programmes and policies likely to have significant impacts on the environment and the development of institutional capacities to carry out those assessments especially in developing countries.

(4) The co-operation of industry in complying with environmental standards.

(5) Increasing the capacity of industry to deal with industrial hazards posed by chemicals; the generation, management and transboundary movements of hazardous wastes; and the minimization of industrial accidents through the institution of adequate safeguards.

(6) Strengthening international efforts to assist developing countries cope with the challenges of achieving sustainable industrial development.

UNCED recognized the need to achieve sustainable industrial development through:

> **"The improvement of production systems through technologies and process that utilize resources more efficiently and at the same time produce less wastes -achieving more with less - is an important pathway towards sustainability for business and industry. Similarly, facilitating and encouraging inventiveness, competitiveness and voluntary initiatives are necessary for stimulating more varied efficient and effective options."**

Agenda 21 also recognized cleaner production and promoting responsible entrepreneurship as key components of sustainable industrial development.

Cleaner production requires the use of technologies that promote the most economical use of resources and the minimizsation of waste. Responsible entrepreneurship also requires the development of new approaches to production which improve the use of resources, reduce risks and hazards, minimize waste and safeguard environmental quality. The new concept introduced by the UNCED process is that higher production can be achieved without compromising environmental quality.

3. INDUSTRIAL DEVELOPMENT IN THE INTERNATIONAL RELATIONS OF AFRICAN STATES: THE STOCKHOLM CONFERENCE

Industrial development is a goal that has been long cherished by African states. In September 1968 African States adopted at Algiers the African Convention on the Conservation of Nature and Natural Resources, having in mind questions of sustainable industrial development. Article V of the Convention imposes an obligation on parties to develop policies to prevent and control pollution.

Industrial development has been regarded as the panacea for the acute poverty suffered by African States. It has dominated the dialogue

between the Northern rich industrialized nations and the poor non industrialized Southern nations. This conflict is illustrated in the statement of the then President Nimieri of Sudan, when he addressed the 1982 Nairobi conference:

> **"In the aftermath of the Stockholm Conference, two different views emerged. One called for giving more attention to the development process and the other stressed attention to the environment. We in the developing countries have opted for development and rejected any measures that may impede its path. This is because development represents the only means to satisfy the basic needs of our people: food, shelter and a decent living. On the other hand, the developed countries have stressed the need to preserve the environment as a safeguard against the negative effects of the development process".[8]**

The international debate on the respective relationship between environment and development, however, dates from an earlier time. It even predates the Stockholm Conference and was behind the formulation of the concept of sustainable development as the means for harmonizing the two seemingly contradictory tendencies.[9]

The apparent contradiction arose from the different perspectives of the developed and developing countries. The former emphasized the need to conserve the global environment and to prevent its further degradation. The latter emphasized the need to achieve development and eradicate mass human poverty. The dilemma facing the developing countries was succinctly stated at Stockholm by the late Shrimati Indira Ghandi, then Prime Minister of India:

> **"We do not wish to impoverish the environment any further and yet we cannot for a moment forget the grim poverty of large numbers of people. Are not poverty and need the greatest polluters? How can we speak to those who live in villages and in slums about keeping the oceans, the rivers and the air clean when their own lives are contaminated at the source? The environment can not be improved in conditions of poverty. Nor can poverty be eradicated without the use of science and technology".[10]**

This point was also made in several of the submissions of African countries at Stockholm.

The reluctance of the developing countries to put environmental concerns ahead of developmental needs can be explained, not on the basis of lack of concern for the environment, but in the context of the other major international debates of the early 1970s. The developing countries were much more concerned with championing a "New International Economic Order" (NIEO) that would redress the imbalance in development between North and South. The imbalance was explained by the past exploitation of the South by the North and the evils of colonialism and imperialism that had been visited upon the South by the North, and by the continuing relationship of neo-colonialism between North and South.

At the Stockholm conference, the North championed unequivocally the need to conserve the environment. This may be illustrated by the impassioned call for environmental conservation made by the late Olof Palme, then Prime Minister of Sweden, to the Conference when he said:

> **"The earth's resources are limited and our environment is vulnerable to the forces set in motion by technical and economic development. The amounts of air and water are restricted and so are the sources of energy. Supplies of raw materials are exhaustible. Uncontrolled pollution of the seas and the atmosphere may permanently upset the processes upon which human life depends. The pressure on our limited resources is accentuated by population growth. Food production cannot feed the growing number of the world's inhabitants. What is ultimately at stake is the survival of mankind on our limited planet."[11]**

This concern of the developed countries was treated with suspicion by the developed countries which arose from other doctrinal wars being waged between the North and the South within the framework of the United Nations and its special agencies. The result was that development was perceived as being opposed to environmental conservation, and developing countries resisted diverting resources from development to environmental conservation.[12]

During the preparatory process of the Stockholm Conference, the search for ways and means of harmonizing development and environment

concerns intensified. At a seminar on Environment and Development held at Founex, Switzerland in 1971 (the Founex Seminar), the participants agreed that environmental concerns should not be seen as a barrier to, but rather as part of the process of, development.[13] This marked the beginning of the evolution of the concept of sustainable development.

The Founex Seminar also recognized that the environmental problems faced by developing and developed countries were different in character. The developing countries were faced with what the Kenyan representative at Stockholm referred to as "the environmental problems of poverty" while the developed countries faced environmental problems "deriving from the excesses of affluence".[14] The Ugandan representative had this to say on the matter:

> **"Developing countries face environmental problems different in degree from those encountered in developed countries of the world. Our fundamental problem is how to raise the material standard of life of our people to levels that are humanly decent. In other words we are not confronted with an environment that has degenerated into pollution as a result of development. On the contrary we are faced with an environment many of whose inherent aspects are prohibitive to development and injurious to human comfort".[15]**

The need to foster industrial development in Africa was also highlighted in the African Common Position on Environment and Development, 1992, which spelt out the African position at the 1992 Rio Conference. This emphasized the need to encourage industrial development but at the same time emphasized the need to conserve resources and to protect the environment and human well being. The African Common Position argued for a reconciliation of industrial development and environmental management.

4. SUSTAINABLE INDUSTRIAL DEVELOPMENT IN THE WIDER INTERNATIONAL ARENA SINCE 1972

The Stockholm Conference had a galvanized the international community to achieve ecologically sound development. This was manifested at both the international and national levels.

Ten years after the Stockholm Conference the United Nations convened another conference on the Human Environment at Nairobi to assess the achievements made since 1972. At this conference, apart from a few states, the statements of the developing countries, including the African countries, had mellowed compared to the ferocious rhetoric of ten years before. The conservation of the environment was no longer regarded as the antithesis of development. Instead, the developing countries reported on their efforts to conserve the environment in their respective jurisdictions. A change was underway.[0] In a different forum, in the same year Dr. Tolba, the then Executive Director of UNEP, caught the tempo of this change when he remarked that:

> **"Today there is increasing recognition of the long-term effects of pollution and environmental degradation, and the old hallmarks of industrial success, smoking chimneys, and polluted rivers, are no longer acceptable. Industry recognizes that it has a responsibility to abate and control pollution as well as to ensure that its products have minimal effects on the environment".[1]**

The Nairobi Conference was the celebration of the emergence of a global consensus on the environment as the primary issue on the international agenda. It was an act of self-congratulation by the international community on the emerging international consensus on the need to implement the Stockholm Declaration and Action Plan. This is demonstrated by the 1982 Nairobi Declaration which,in its first paragraph states:

> **"The Stockholm Conference was a powerful force in increasing public awareness and understanding of the fragility of the human environment. The years since then have witnessed significant progress in environmental sciences, education, information dissemination and training which have expanded considerably; in nearly all countries, environmental legislation has been adopted and a significant number of countries have incorporated within their constitutions provisions for the protection of the environment".[2]**

However, the states gathered at Nairobi continued to recognize the need to overcome the environmental pollution of poverty and to urge the richer countries to assist the poorer countries to

acquire ways and means to overcome those problems through ecologically sound development.[3]

4.1 Sustainable Industrial Development, States and the Private Sector

While by 1982 it was clear that governments of both developed and developing countries were willing to make sacrifices in the interest of environmental conservation, industry appeared reluctant to follow suit. That industry had grown a phobia for environmental conservation and the ever more exacting environmental standards was demonstrated in the 1960s and 1970s by the flight of smoke-stack industries from the developed countries to the developing countries of Asia and Latin America which had less demanding environmental standards.

At the World Industry Conference on Environmental Management (WICEM) - convened by UNEP and the International Chamber of Commerce (ICC), some developing and industrialized countries, and a number of major transnational corporations at Versailles, France between November 14 to November 16 1984 - industry began to overcome its fears.[4] The Conference recognized that sustained industrial growth could only be achieved if environmental considerations were taken into account. As David Roderick, Chairman of the United States Steel Corporation, observed on behalf of the conveners of WICEM:

> **We face a modern challenge to develop a co-operative effort for protecting the World's environment while achieving economic growth. We reject outright the false notion that environmental improvement and industrial development are mutually exclusive".[5]**

The shape of the things to come was highlighted by Mrs. Gro Harlem Brundtland, Chairman of the then on-going World Commission on Environment and Development. She argued that there was no opposition between environmental protection and development, and that in practice the two were integrated:

> **"We can only achieve sustainable growth provided we manage to protect the environment and we shall only succeed in protecting the environment if we can accomplish sustainable growth".[6]**

A heightened sense of responsibility on the part of industry for environmental management resulted from WICEM as is demonstrated by the principles for Industry and Environment adopted by the Conference as follows:

1. Sustainable economic development is an essential international goal. Environmental management should be an integral part of economic development. Environmental issues should be addressed in the earliest stages of the economic planning and development process. Special recognition should be given to the environmental problems created in urban areas by unchecked migration from rural areas.

2. Economic growth can be made compatible with environmental protection.

3. Cost/benefit analysis is, despite its limitations, an essential element of environmental decision making. The cost/benefit system should be improved to attempt to quantify the value of critical elements in our cultural heritage.

4. There is not only the direct cost of environmental protection that has to be considered, but also the cost of damage to society as a whole.

5. An anticipatory and preventive approach to the threat of environmental degradation is preferable to correcting environmental problems after they have occurred.[7]

5. SUSTAINABLE INDUSTRIAL DEVELOPMENT AND INTERNATIONAL LAW

Since 1972, the international consensus on the primacy of environmental issues on the international agenda has led to the translation of agreed policies into a body of international environmental law with implications for sustainable industrial development.[8] This body of international law consists of rules of customary law, international conventions and non-binding standards contained in resolutions of international organizations. In the making of this body of international law, the international community has taken into account the needs of the developing countries, as demonstrated in the discussion that follows.

5.1 Customary Law

According to Article 38 (1)(b) of the statute of the International Court of Justice, "International custom, as evidence of a general practice accepted as law" is a source of international law.

As a source of law, custom has been important in the evolution of binding international rules on the responsibility of states for transboundary environmental damage.[9] Indeed, one of the earliest cases defining responsibility for transfrontier environmental damage related to damage caused by a factory spewing air pollutants across an international boundary resulting in extensive loss and damage in the other state.[10]

The older norms of international customary law, such as the case of state responsibility, have now been complemented by new and emerging norms. These norms are contained in the Declarations of international organizations. The declarations are in form non-binding but some of the norms they prescribe have since been translated into binding customary rules by the practice of nations.[11] A case in point is the Stockholm Declaration of 1972 which provides what states have called "a basic code of environmental conduct for the years to come".[12]

The evolution of a customary rule of law, however, is a complicated process, requiring consistent State practice which is widespread and is pursuant to a belief that there is a binding rule of law. Although the International Court of Justice in the *Continental Shelf Cases*[13] was of the view that if the practice is intensive and extensive, a rule need not have existed for a very long time,[14] the determination of whether a rule of international custom exists is complex. It is for this reason that, in responding to threats to the environment, States have resorted to the development of international conventions and other standards.

5.2 International Conventions and other Standards

The trend in the development of international environmental law since 1972 has mainly been through the adoption of international conventions (or treaties) which are inherently binding, and of international standards (or "soft law") such as declarations and resolutions of international organizations which represent an expression of the consensus of the international community, but not necessarily of binding legal norms.

Due to the large number of the legal instruments adopted in this field, it is not possible to deal with each instrument at a time. What is proposed is to look at how far the international community has gone in striving to achieve sustainable development along broad thematic strategies.

(i) Sustainable Utilization of Natural Resources

Industry depends on natural resources. The fact that the natural resources of the earth were exhaustible has long been recognized. Principle 2 of the Stockholm Declaration states that:

> **"The natural resources of the earth, including the water, land, flora and fauna and especially representative samples or natural ecosystems, must be safeguarded for the benefit of present and future generations through careful planning or management, as appropriate".[15]**

The concern to conserve natural resources resulted from alarming predictions of the exhaustion of the world's resources championed by theorists of "the limits of growth theory" which became fashionable in the 1970s.[16] The fears raised at the time have since been overcome by the conservation efforts of the international community and the discovery of more natural resources. In spite of these advances, the conservation of natural resources has continued to shape the relations between states. In recent years, a number of international agreements, including commodity agreements, have contained provisions for the conservation of resources for future generations by careful use, and where possible, by restoration.[17] Indeed environmental considerations continue to shape future trade in natural resources as was demonstrated by the Uruguay Round of GATT negotiations.

(ii) Sustainable Utilization of Human Resources

At the heart of the issue of sustainable industrial development lies the human factor. It is labour that makes industry possible and, therefore, environmental safeguards for labour must be at the heart of the notion of sustainable industrial development. The international community has for many years been involved in this aspect through the work of the International Labour Organization (ILO). The ILO has spearheaded the

creation of an enlightened code of labour laws both at the international and national levels.[18]

(iii) Use of Environmentally-Benign Technologies

Unless industry eschews the use of polluting technologies, sustainable industrial development cannot be achieved. But doing so requires a deployment of new resources in research and development (R&D). While the rich industrialized countries have the resources to employ in R&D, the poor African countries and other developing countries do not. Their limited resources must instead be applied to development needs such as schools, health and nutrition. Additionally, African countries, like other poor countries, depend on foreign investment for industrial development. There is a fear that a country which establishes high environmental standards is unlikely to attract foreign investors. This is a paradox faced by developing countries as was observed by the head of the Kuwait delegation at the Stockholm Conference:

> **"Development versus pollution is a vexing problem. The rich countries got to where they are now by relying on a technology that was largely polluting. This is the technology available at present for development. In my opinion the most important way the rich and industrialized countries can help developing countries is by conducting research to find non-polluting development methods. The developing countries would welcome non-polluting technology offered at a reasonable price. No one has any special wish to pollute the environment. But if we cannot get a clean technology, development will continue to cause environmental pollution".[19]**

The issue articulated here is that the use of environmentally-benign technologies is intrinsically linked to the question of technology transfer and acquisition. However, the entire question of technology transfer, especially as regards the modalities of transfer, is complicated. This complication arises out of the debates of the 1970s when the transfer of technology was seen by developing countries as a moral right on the basis of the ideal of a new and equable international economic order. The moral issues notwithstanding, the 1980s brought a new climate of realism whereby the property rights inherent in technology have been recognized as rights to be paid for. As Dr Tolba observed:

> **"The challenge is to find technology transfer mechanisms as innovative as the technologies themselves. A balance among development objectives, environmental protection and patent rights must be struck. Owners of industrial property cannot be expected to surrender hard-worn technological advantages freely. Innovative thinking is needed to resolve private claims on patents trade marks and other industrial rights and a code of conduct on the transfer of environmentally-benign technologies".[20]**

The international community has started translating this new philosophy into the practice of states by making new international rules. It has sought to avail funds for environmental concerns by urging the richer nations to provide new and additional finances for the development of clean technologies. As Dr. Tolba observed:

> **"As primary contributors to today's global ecological crisis, developed countries also have a responsibility to provide direct and additional financing for the research and development of environmentally-benign technologies designed especially for developing countries".[21]**

This was also recognized by UNCED in the Rio Declaration, Principle 7 which states that:

> **"States shall co-operate in a spirit of global partnership to conserve, protect and restore the health and integrity of the earth's ecosystem. In view of the different contributions to global environmental degradation, states have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command."**

The concept of "common but differentiated responsibilities" is new and arises from a realization of the need for a re-distribution of inter-

national responsibility in environmental matters.

The drive towards cleaner production was also championed by Agenda 21. It recognized cleaner production as one of the key avenues to sustainable development. Cleaner production was defined as the struggle to achieve optimal efficiencies at all levels and stages of the product cycle. Cleaner production improves competitiveness and ensures less waste. The achievement of this goal was thought to be through an appropriate partnership between Government and industry whereby government makes laws and sets the standards while industry implements the laws through an awareness of the benefits to the community and in its own self-interest.

Secondly, it is not enough that clean technologies are devised. It is more important that developing countries are provided with the means to acquire these technologies as they are unlikely to be availed free of charge. To ensure the transfer of these technologies the trend in recent international instruments is to establish for financial mechanisms, including the establishment of international funds.

Some of the recent of these mechanisms include the Multilateral Fund established in June 1990 under the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987.[22] This operates under the authority of an Executive Committee established by the Parties. The Fund is financed by the Parties to the Protocol on the basis of the U.N. scale of assessment. It also serves as a mechanism for making financial contributions for transfer of technology to developing countries. It also has a "clearing house function" whose purpose is to channel bilateral assistance in ozone-related matters from the donors to the recipients.[23]

The model established by the Montreal Protocol financial mechanism pointed the way. In the Convention on Biological Diversity, 1992 prepared under the auspices of UNEP, a financial mechanism, not unlike the one for the Ozone Layer was agreed on.[24] GEF currently serves as the financial mechanism for the Convention.

Beyond sector-specific mechanisms, the international community has created a Global Environment Fund. The rationale was clearly stated by Dr. Tolba:

> **"What is at issue is an investment in the future. Nations of the world may not have a common past but they certainly have a common future in the betterment or well being of which they have at stake, a new order or priorities based on global partnership is needed. It must be an order in which everyone from all parts of the globe pay their shares in a common pool of resources to combat environmental dangers."**

In this regard UNEP, the World Bank and UNDP took the lead in establishing the Global Environment Facility (GEF) to assist developing countries implement programmes that protect the environment which would not otherwise be supported by existing development assistance or environmental programmes. The programme, which started as a pilot project only in the areas of the ozone layer, climate change, biological diversity and the protection of international rivers[25], is now on a firm footing.

Besides the establishment of international financial mechanisms, recent international agreements also provide for technical assistance and training for experts from developing countries.[26]

(iv) Production of Environmentally-friendly Products

If industrial development is to become sustainable, it must produce products which are environmentally friendly. In pursuance of this objective, the international community has sought to prohibit the use of products that degrade the environment. The current drive to save the ozone layer is a case in point. Under the Vienna Convention for the Protection of the Ozone layer, 1985 and its Montreal Protocol, 1987[27] and the subsequent Amendments and adjustments,[28] a number of substances that deplete the ozone layer are required to be phased out of production by the beginning of the next century. These landmark agreements represent a new determination by the international community to protect the global environment.

The international community has not focussed only on banning environmentally injurious products but has also required that such substances be controlled where substitutes are not easy to find. This approach is symbolized in

the London Guidelines on the Exchange of Information on Chemicals in International Trade. The Guidelines provide for the safe handling of chemicals especially those banned or severely restricted in countries of manufacture and require the exchange of information on those chemicals under the Prior Informed Consent Procedure (PIC).[29] Negotiations are underway for the conclusion of an international treaty on the subject. A similar approach has been taken for the management of pesticides through the adoption of the FAO Code of conduct for the Distribution of Pesticides.

(v) Waste Minimization

Waste minimization is a necessity to sustainable industrial development because of the need to conserve natural resources for the future, and because of the need to reduce the hazards to the environment posed by wastes. Due to these concerns, the international community has moved towards the adoption of low- and non-waste Technologies (LNWT).[30] This effort began with the work of the Economic Commission for Europe (ECE)[31] and has recently been concretized in the Basel Convention on the Control of the Transboundary Movement of Hazardous Wastes of 1989. Article 4(2)(a) of the Convention provides that:

"Each State shall take the appropriate measures to:

(a) ensure that the generation of hazardous wastes and other wastes within it is reduced to a minimum, taking into account social, technological and economic aspects".

Article 10(2)(b) provides further that the parties shall:

> **"Co-operate, subject to their national laws, regulations and policies, in the development and implementation of new environmentally sound low-waste technologies and the improvement of existing technologies with a view to eliminating, as far as practicable, the generation of hazardous wastes and other wastes and achieving more effective and efficient methods of ensuring their management in an environmentally sound manner, including the study of the economic, social and environmental effects of the adoption of such new technologies".**

In the bid to achieve waste minimization, reclamation of waste and recycling have been promoted. This has increased the efficiency of industry in utilizing the exhaustible natural resources of the earth.[32] Like other aspects of industrial development waste minimization can only be achieved if the necessary technology is acquired by developing countries.

In the African context, the Bamako Convention on the Ban of the Import into Africa and the Control of Trans-boundary Movement and Management of Hazardous Waste within Africa was adopted by the OAU Conference of Environment Ministers on 30th January, 1991. It bans the import into Africa of hazardous wastes and obliges States to observe rigorous environmental standards within Africa including waste minimization measures. It further requires states to take measures to protect human health. The Convention otherwise applies the regime of the Basel Convention to Africa.

6. NATIONAL IMPLEMENTATION OF INTERNATIONAL OBLIGATIONS

In the African context, at the national level, the impact of the Stockholm conference was translated into the development of national institutions and mechanisms to ensure conservation of the environment. A 1989 study of UNEP's Environmental Law and Machinery Unit observed that since 1972, 24 African states had created ministries of the environment and natural resources. Many more states have full fledged departments of environment or other structures just below ministry status.[33] To date the UNEP's Environmental Law and Institutions Programme Activity Center has on its register of national institutions in the field of the environment a record of 189 countries which have established such institutions including ministries, autonomous environment agencies and departments.

These institutions and mechanisms have been complemented by the adoption of comprehensive laws on the conservation of the environment generally and on the various sectoral concerns such as wildlife, forestry, agriculture, marine resources, labour and fresh water resources. In the specific area of industry, laws on management of wastes, and technology options have been adopted by various countries.[34]

National law should be seen from two

perspectives; the evolving nature of existing law to accommodate new concerns of sustainable development and the making of new legislation to address the emerging environmental concerns.

7. THE COMMON LAW AND REGULATION OF INDUSTRY AND ENVIRONMENT

Common law principles play a major role in the management of the environment in general, and of industry in particular. Some of the common law's key principles originate from the law of torts and these include the law of nuisance, negligence and trespass. The principles protect a person's right from the infringement and have been used to control specific types of behaviour which violate the environmental rights of others.

The rules relating to nuisance are of particular significance to industry because they have been used by courts in various jurisdictions to control pollution by vibration, noise, smell, or effluent.[35]

Negligence has also been used as a tool to ensure that industry remains responsive to the needs and rights of the public. The law relating to negligence assumes that a person who manufactures a product has a duty to the consumer and that, if he fails to observe proper care and causes injury to the consumer, he may be held responsible.[36]

The duty of care imposed in the law of negligence is relevant beyond consumer law and extends to areas of environmental management where industry's activities may have adverse effects on the rights of others if the appropriate duty of care is not observed.

In addition to negligence and nuisance, the rule in Rylands V Fletcher[37] is relevant to relations between industry and the public in matters relating to the environment. The rule protects individuals who may be hurt by dangerous forces which may escape from the control or property of another person and cause damage.[38]

The law relating to trespass to property is also relevant to environmental issues. The intrusion of substances or objects under the control of one person into the property of another which causes damage to such property may give a cause of action to the affected party.

There are other relevant branches of the law of torts like occupier's liability and vicarious liability, which are relevant to the relations between industry and environment.

However, common law principles, and in some jurisdictions, case law, must be seen within the context of the primacy and supremacy of statutory law. A number of the common law principles have been strengthened by statutory reforms.

8. PRINCIPLES COMMON TO DEVELOPING FRAMEWORKS FOR ENVIRONMENTAL LEGISLATION IN AFRICA.

A framework for environmental legislation should be conceived within certain parameters. These parameters should guide the policy maker and stakeholders in policy. They are based both on the concrete analysis of each particular country's history, and the comparative experiences of other countries. There is no claim that the following parameters are "all-inclusive" or the final word but they are tools which may be employed in assessing a situation at hand:

8.1. The Social and political setting of environmental law

Environmental law must be seen within the entire political, social, cultural and economic setting of a country. If the goal of environmental law is to achieve sustainable development, as it is generally agreed to be, environmental laws must be geared towards each particular country's stage in development. There are no universal models of legislation which are appropriate to all countries. Each country must, therefore, formulate environmental laws which reflect its own realities at a given time.

The Brundtland Commission, as seen above, underscored this need for particularity in environmental management by defining sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.[39]

It follows, therefore, that environmental legislation should be framed in such a manner that it acts as an aid to economic development, rather than a hindrance. The principles, rules, standards and institutions established by legislation should be in harmony with each society's need to

achieve better material standards and to defeat poverty.

The movement towards environmental legislation should be in harmony with the prevailing governments' efforts and need to attract more foreign and local investment and to channel national energies into more productive endeavours in industry.

8.2. Constitutional and administrative setting of environmental law:

Environmental legislation should also be seen in the context of the constitutional and administrative setting of each country. The definition of individual rights, especially those relating to a clean and decent environment play a crucial role in the efficacy of environmental laws. The system of administration that enforces laws has an important role in the achievement of sustainable development. The laws framed must be made compatible with the entire legal system. It should be noted that a number of African countries have already adopted constitutions which recognize and promote the right to a decent environment. In Uganda, Namibia and South Africa for example this right has been clearly set as an integral part of the Bill of Rights in the constitution.

The inclusion of a human right to a decent and healthy environment in the Bill of Rights has some major implications. Every right has a corollary duty. Therefore, a right to a decent environment imports the duty of each person to protect the environment. A right also creates a complementary capacity if it is to be meaningful. In this case the individual should have the capacity to bring an action for breach of the right to a decent and healthy environment and for failure to observe the corollary duty. Such capacity is general notwithstanding that specific rights in person or property of the given individual have not been violated. In some countries (e.g. Uganda) the Constitution, which includes the right to a decent and health environment, provides that the violation of any human right entitles any person to sue for redress of such violation even if the violation did not affect the plaintiff personally (See Article 50 of the 1995 Constitution).

The issue of key interest to industry is whether this expansion of *locus standi* (ability to bring an action) with regard to environmental matters is to be regretted. It increases the number of possible litigants if industry infringes the law but the present trend is a call for compliance. Compliance protects industry and spreads the benefits of good environmental husbandry to all.

8.3. Environmental law within the wider policy context

Environmental legislation is not the only tool for environmental management. Other factors such as general policy, education and awareness are equally important. Therefore a decision maker must determine, at the outset, whether the making of a law is the best means of achieving given policy objectives. At times it may be more desirable to use tools which are less mandatory than law to achieve given environmental objectives. This is especially favoured where law would interfere with settled human rights or be repugnant to morality and accepted standards of behaviour, or would be difficult to implement.

Examples of situations where law may not be appropriate include population control. While it is accepted that high population growth rates often lead to environmental degradation, most countries have favoured policies that stress family-life education rather than compulsory limitation of the number of children each person may have. Likewise in the sphere of land use in rural areas, most countries have favoured a combination of economic incentives and education through extension services to promote the growth of certain crops or economic activities rather than compulsory zoning laws. Similarly, in the field of sustainable industrial development, it is necessary to combine the use of the law with more persuasive measures such as the use of incentives and facilitative policies to gain compliance. The determination of what mechanism is appropriate in a particular case is, therefore, an essential step in the process leading up to environmental legislation.

8.4. Determining the mission of legislation

The objectives of legislation have to be determined at the outset. Clear objectives should also be set out in the statute itself. Does the legislation seek to promote standards of good environmental husbandry or to discourage certain forms of misconduct? The following are some of the general objectives environmental legislation seeks to achieve, and which are relevant to industry:

a) To provide a system for obtaining environmental data for use by governments and individuals in making decisions affecting the environment and the exploitation of natural resources.

b) To anticipate environmental damage (e.g through long term planning and environmental impact assessments)

c) To prevent environmental damage (e.g through monitoring and environmental audits)

d) To manage the sustainable utilization of environmental resources (through the establishment of viable environmental standards).

e) To control the by-products of utilizing environment resources (i.e. pollution).

f) Where damage has already occurred environmental legislation may also seek to achieve.

a) discontinuation of the harm,

b) compensation to the individuals harmed.

c) restoration of the environment.

8.5 Prospective approaches to environmental management

Modern environmental legislation concentrates more on the prospective approach (anticipation, management and prevention) rather than the retrospective approach (punishment, compensation, restoration etc). The adage that prevention is better than cure is best applicable here. The principal reason behind this approach is that it is more expensive to repair environmental damage than to prevent it.

Laws on industry which mostly were enacted in colonial times tend to be retrospective, emphasizing punishment for infringement as the sole means to promote environmental conservation.

The importance of pursuing precautionary approaches to the management of the environment has been emphasized by principle 15 of the Rio Declaration. It provides:

"In order to protect the environment, the precautionary approach shall be widely applied by states to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost effective measures to prevent environmental degradation."

Within national jurisdictions, this principle may be achieved by the following instrumentalities:

(a) **Planning** for environmental management at the local, regional and national levels. At lower levels planning enables taking into account the peculiarities of locality and circumstance. At the national level, the larger picture is taken into account. Planning is a periodic exercise which enables revision to take into account lessons learned and to concretize the gains realized.

(b) **Environmental Impact Assessments**

(EIA): An environmental impact assessment is a study conducted to determine the possible environmental impacts of a project. It is a study conducted before the commencement of the actual project. By studying the possible impacts, it is possible to avoid the adverse impacts by either redesigning the project or by taking mitigation measures. In some cases, it is possible to stop a project all together. Understanding EIA would help industry to avoid possible litigation by ensuring that it does not undertake obviously environmentally harmful projects. Since EIA involves public participation in deciding whether or not a project is desirable, the investor will know the public's perception before hand. Positive public perception can translate into a financial saving.

(c) **Environmental Audits:** While EIA deals with whether a project should actually be undertaken and, therefore, precedes the project, an audit is the tool for ensuring that the project continues to perform in accordance with the set standards. Like the EIA, the environmental audit is also a study. It has been defined as:

"A management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organization, management, and equipment are performing with the aim of helping to safeguard the environment by:

(i) facilitating control of environmental practices,

(ii) assessing compliance with company

policies, which would include meeting regulatory requirements".

(See UNEP.IEO Environmental Auditing, UNEP, Paris, 1990 of page 1)

Originally an environmental audit was a company tool used by each company to evaluate its own performance. Today, various national laws, while acknowledging that a company may carry out its own audit voluntarily, have extended the scope of the tool to include activities which may be carried out by public agencies, through inspections to determine;

(i) In the case of projects where an EIA has been carried out, whether the performance of the project in practice complies with and compares to the predictions made at the time of EIA and in relation to set standards and what requires to be done;

(ii) In the case where a project was not subject to EIA, how the project performs in relation to the set standards and what should be done to foster compliance;

(iii) In both of the cases to determine how the entire system is operating and whether any stress which may lead to an environmental emergency exists.

(d) **Monitoring** While EIA and audits emphasize specific projects and how to manage their impacts, monitoring looks towards the whole system. It looks at the wider aspects of the effect of systems on the entire ecosystem which has to be studied in order to safeguard the environment against damage. In this regard both public organizations and industry must co-operate to ensure successful monitoring.

Benefits to industry: These prophylactic measures, being predictive instruments, enable industry to avoid liability caused by damage from their activities. While these predictive instruments cost money at the outset, they act as an insurance against future risks. Even when the risk exists, the investor is equipped with foreknowledge and hence the ability to safeguard. The benefits - a better environment - go to all.

8.5. The style of legislation

The subject matter of the legislation is of the essence to the style of instrument chosen. Where the need is to create clarity in the existing legal norms, and to bring them into one comprehensive text, then a code is appropriate. Where the aim is to maintain sectoral competencies and yet ensure co-ordination a framework legislation has been found appropriate. This has been defined as" legislation which lays down basic legal principles without attempting to codify all relevant statutory provisions".

While codification is appropriate to certain sectoral concerns (e.g. water, wildlife, energy etc), framework legislation is appropriate as a basic law on the environment to co-ordinate existing sectoral concerns. Since the mission of the framework legislation is standard-setting and co-ordination, it is often necessary to strengthen sectoral laws in order to create a strong system of environmental law.

8.7. The institutional arrangement for environmental administration

Having determined the style of legislation to be adopted, and the objectives to be achieved, it is necessary to put in place the institutional arrangement to achieve them. The size, nature and functions of the institutional arrangement depend upon the functions to be carried out and the capacity to afford the institution sought. It would be contradictory to seek to achieve sustainable development using an institution which is inherently unsustainable in the social and economic circumstances. The participation of local people in the management of environmental resources is a question pertinent to the institutional arrangement that should be addressed. Clear answers are required as to how, at what level, and in what context they are required to participate. However, the need for public participation itself is taken as a mandatory requirement.

8.8. Framework legislation

While framework legislation should not seek to codify existing legal provisions on all sectors affecting the environment, it should nevertheless lay down some basic guiding principles in the conservation of those resources. These principles have a dual purpose. First, they enhance the co-ordination function of the institutional arrangement established under the law. Second, they act as residual general principles which can be applied to ensure the conservation of environmental resources where the sectoral laws are found wanting. Most framework legislation in various countries, therefore, have laid down general principles regarding air quality, water quality, disposal of effluent and solid wastes, and

conservation of energy resources. The elaborate definition and regulation of these specific sectors, however, should be left to specific sectoral laws. Subsidiary legislation under the framework legislation could also be used to fill in some of the gaps.

Just as it is necessary to lay down the basic principles regarding the various sectors affecting the environment in the framework legislation, it is also essential to include in such an instrument the basic tools of environmental management as general standards to be observed in all cases. These basic tools include the requirement for environmental impact assessments, environmental monitoring and environmental audits for all activities, plants and establishments that may significantly affect the environment. Other principles which are relevant here include compensation for those affected by environmental damage and restoration of the affected environment. These latter principles are retrospective in character but are nonetheless important.

8.9. The relevance of sectoral legislation

General principles and tools are appropriate for inclusion in a framework legislation on the environment but their place in the sectoral laws needs to be given attention. This is determined by the relationship between the institutional arrangement for environmental conservation and the sectoral agencies that the policy-makers would like to promote. Where the intention is to concentrate and centralize all functions in the institutional arrangement, it is unnecessary to include the tools and principles in the sectoral laws and agencies. On the other hand the provision for the tools and principles in sectoral legislation and agencies is necessary where the institutional framework for environmental management is conceived as a co-ordination center for all the sectoral agencies.

8.10. The principle that the polluter pays

Environmental resources are not free goods but must be paid for. This is especially important for industries because ultimately industry must make profits for the shareholder. As a basic public good, the environment should at best be taken care of out of public funds. This ideal situation does not always hold. In a developing country where the meeting of basic budgetary needs out of national revenues is not easily attainable, the idea that conservation needs be met out of the usual public coffers would only be an aspiration rather than an immediately realizable goal. Meeting conservation needs, therefore, requires the creation of novel techniques of raising finances. There are a number of existing devices in various countries employed in the raising of finances. These include:

(a) Charges for services rendered by the institutional organ in charge of the environment;,

(b) pollution charges;

(c) licenses and permits for various activities;

(d) fines for infraction of environmental law;

(e) environmental bonds;

(g) funds from external sources including both bilateral and multilateral financial arrangements.

These money raising devices should be seen across the entire spectrum of the system of environmental law. Each device should be employed in an appropriate sector. In the sector of industry, all these devices have relevance and have to be studied closely.

Underlying these approaches is the polluter pays principle. The polluter should repair the damage he has caused either by making actual reparation or paying the necessary monetary compensation to society. Such compensation can be paid either before or after the event. Payments before the event can be in the form of deposit bonds which are tied to environmental performance to be forfeited if performance falls below expected standards. Care must be taken to ensure that the payments are not too high and impose an unnecessary burden industry. In some countries, systems for a priori payments have been put in place for pollution licenses (See the National Environment Statute, 1995 Uganda, Part VIII). Pollution licenses are envisaged to be applicable if the industrialist's activities will cause pollution beyond the established standards. A sum equivalent to the cost of the repair of the pollution is required to be paid. The expectation is that such money will be applied by the public authorities to redress the effects of the pollution.

Payments after the polluting event may be made after the determination of a court that set standards have been infringed. These payments

should again be commensurate with the harm caused and be capable of redressing such harm; through restoration and compensation.

An important factor in the area of financing environmental concerns is the issue of whether the institutional arrangement chosen has access to the funds realized. The ordinary financial arrangement tends to require that all public revenue accrues to the national treasury. In some cases, bureaucratic problems and different government priorities may lead to revenue generating agencies such as those dealing with industry, natural resources and environmental conservation getting none or little of the revenue they generate. The creation of environmental funds and other financial mechanisms may be appropriate to ensure that the finances generated by environmental conservation agencies is ploughed back into conservation. The creation of such financial mechanisms, however, must take into account the fact that not all sectors that take care of public goods can raise their own revenue (e.g police, defence etc). Appropriate arrangements have to be made, therefore, to ensure that a sharing of revenues to take care of these other public goods is made.

8.11. Novel approaches for enforcement of environmental laws

The enforcement of environmental law is an important issue which has to be taken care of by all legislation. The traditional forms of enforcement by means of fines and terms of imprisonment may not be sufficient to ensure compliance. Many countries are trying to move away from the command theory of criminal law to the use of economic devices such as incentives and dis-incentives in the form of taxes and charges for behaviour deleterious to the environment and tax credits, tax exemptions, rewards for good environmental performance, soft loans and subsidies as incentives. The primary motive behind this approach is to modify behaviour by using economic factors rather than legal compulsion. Economic factors are preferred because they have within them an inherent logic towards compliance. This is preferable to reliance on law enforcement officials and litigation in courts which is expensive and does not necessarily promote a conservation ethic within the industrial sector.

Beyond the traditional form of sanctions (punishment for infraction) and the emerging concern with economic incentives and dis-incentives, another trend is developing in the drive to ensure enforcement. Environmental considerations have been key factors in the development of legal requirements for the registration, labelling, control on advertising, and classification of dangerous processes, products and by-products such as hazardous chemicals and waste. To ensure that these requirements are met, the law requires reports on potentially dangerous inputs, products, processes, and by-products and provides for inspection and analysis of inputs, products and by-products. These techniques have been used particularly in specific legislation relating to hazardous substances and wastes, and they are pertinent to sustainable industrial development as well. Examples of these approaches may be found in the recent laws enacted in Uganda, Malawi, Zambia and Ghana.

8.12. Implementing international obligations

While it is important that legislation should cover important aspects of the regulation of conduct within the municipal sphere, the external dimension cannot be forgotten. In a world characterized by expanding multilateral co-operation and an emerging transnational order, external factors become crucial in decision making in the municipal sphere. International standards have quickly become pace-setters for municipal law making in the field of the environment.

Principally, legislation should address the transformation and implementation of international obligations into municipal law. International obligations are imposed by operation of customary international law, treaties and general principles of law accepted by all nations. In countries which follow the dualist conception of the relationship between national law and international law, as do most Commonwealth countries, international treaties do not become part of municipal law until the legislature passes a law "domesticating" them. Customary international law is considered part of municipal law. Treaties have to be taken into account by translating them into municipal law. Even where treaties automatically become part of municipal law, only those treaties which are self-executing will create immediate obligations for individuals and corporations. For non self-executing obligations domestic legislation is still needed to give them effect in municipal law.

An appropriate legal framework for environmental management should take into account the problems associated with trans-boundary resources such as shared waters and aquatic biodiversity, and the issues of migratory species of

wild animals. Since industry affects these resources, the standards set for their conservation is an important concern. It must also be remembered that modern business operates in the so-called global village.

The translation of transnational concern into municipal environmental policy is a recognition of the unity of the global environment. Law enables transnational environmental risks to be avoided and their consequences mitigated. Transnational efforts create a uniformity of philosophy and effort to sustain the environment thus serving as a harmonizing factor over and above parochial preoccupations with national sovereignty.

9. CONCLUSION

The story of the international relations between North and South on the subject of industrial development tells a story of progress. From the confrontations over environment and development in the 197Os, the international community has moved towards a consensus on the issue of sustainable industrial development. The emerging consensus has been translated into international legal obligations which are, on the whole, beneficial to the developing countries, including those in Africa. The achievement of the aspirations of African countries the is yet to come. There is, however, a ray of hope.

At the national level, international consensus has been translated into legislation. This has led to the shift from the old common law positions anchored in the law of tort and criminal law to prospective approaches of anticipation and prevention. These approaches save money and time for both industry and the wider public and help ensure a healthy and decent environment.

FOOTNOTES

1. See WCED: Our Common Future Report; of the World Commission on Environment and Development, Oxford University Press, 1987.

2. See Ibid., the overview of the WCED, "From one Earth to one World".

3. *Ibid.*, Chapter 2 para 1.

4. *Ibid.*, para 4.

5. *Ibid.*, para 5.

6. Mr. Tolba "Sustainable Industrial Development" Vol. 12 (1989) No.3-4 *industry and Environment* page 2.

7. WCED *Supra* Chapter 8.

8. Mr. Tolba (Ed) *Evolving Environmental Perception: From Stockholm to Nairobi,* London, Butterworths, 1989. (herein cited as Tolba: *Perceptions)* p. 84.

9. See J. Ntambirweki: "The Developing Countries in the Evolution of an International Environmental Law with particular Emphasis on the work of the United Nations Environment Programme". Vol. 14 No 4 Hastings International and Comparative Law Review. Page 915

10. See Tolba: *Perceptions op. cit. p.* 97 and R.P Anand Environment and Development: The Case of the Developing Countries" (1980) Vol 20 IJIL p. I at p.10.

11. See Tolba: *Perceptions, Ibid.*, p. 51.

12. See the statement of the Brazilian Delegation *Ibid., p. 135.*

13. See UNEP: *The State of the Environment 1972-1982,* UNEP, Nairobi at p.6-7 and see also the *Report of the United Nations Conference on the Human Environment,* United Nations, New York, 1973 Document: A Conf. 48/14 Rev. 1 (here in cited as UNCHE Report) at p. 38.

14. Tolba; *Perceptions, Supra* at p. 241.

15. *Ibid,* at p. 342.

16. For a general view, see: excerpts of Country Statements in Tolba: Perceptions Supra.

17. See Tolba "Industry and Environment the Next Decade", Special Issue No. 3 (1982) *Industry and Environment p. 3.*

18. See the Nairobi Declaration in Tolba: *Perceptions p. 9.*

19. See para 7 of the Declaration.

20. See the *World Industry Conference on Environmental Management: Outcome* and *Reactions,* Special Issue No. 5 (1984) *Industry and Environment.*

21. *Ibid., p.* 6.

22. *Ibid., p.* 7.

23. *Ibid., p. 10.*

24. See generally Ntambirweki *Supra,* Note 9.

25. See Gunther Handl "Territorial Sovereignty and the Pollution", 1975 Vol. 69 AJIL p. 55.

26. The Trail Smelter Arbitration (1941) Vol 35 AJIL, p 684

27. Ntambirweki, *Supra* note *9.*

28. See paragraph 1 of the Nairobi Declaration.

29. (1969) ICJ Rep. p. 3.

30. See para 74 of the Judgement of the Majority see also the dissenting judgement of Manfred Lachs.

31. See UNCHE Report. p. 4.

32. See J.R.D. Tata: *An Approach of Ecology and Economic Growth in* Special Issue No. 3 (1982) *Industry and Fnvironment p.* 54.

33. A good example here is the International Tropical Timber Agreement adopted at Geneva on 18 November 1983 which entered into force on 1 April 1985.

34. For a summary of international environmental laws in the work place see: UNEP: *Register of International Treaties and Other Agreements in the Field of the*

Environment UNEP, Nairobi 1989. Doc. UNEP 15/Inf.2

35. See Tolba; *Perceptions, p.* 252.

36. Tolba *Supra* note 6.

37 Ibid.

38. See the "Report of the Second Meeting of the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer, London 27-29 June 1990. Document UNEP/OZL/ Pro 2/3 in particular Annex 2 on Amendments to the Protocol.

39. *Ibid.*, see Article 1().

40. See "Report of the *Ad hoc* Working Group of Experts on Biological Diversity on the Work of its Second Session in Preparation of a Legal Instrument on Biological Diversity of the Planet, Geneva 19-23 February, 1990. Document UNEP/Bio. Div/2/3 at p. 6.

41. The World Bank: Funding for the Global Environment: The Global Environmental Facility, Discussion Paper, November 1990.

42. See Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal, 1989 Article 10., Vienna Convention for the Protection of the Ozone Layer 1985, Articles 3 and 4. Montreal Protocol on Substances that Deplete the Ozone Layer, Article 10. London Guidelines for the Exchange of Information on Chemicals in International Trade (Amended Version) 1989 part III.

43. See Article 2 of the Protocol.

44. See the Amendment and Adjustments to Article 2 and Annex I and the additional Annexes adopted at London refer note 40 *Supra.*

45. See part 11 of the guidelines.

46. For a general review of the international efforts on waste minimization see Vol 12 No. I (1989) *Industry and Environment* (whole issue).

47. See C. Lopez-Polo: "Low- and Non-waste Industrial Technology: A focus for International Co-operation in the Economic Commission for Europe" Vol 7 No. 4 (1984) *Industry and Environment* page 28.

48. See Francis Veys. "Reclamation and Recycling an Indispensable Industry for the Management of Natural Resources and Environmental Protection" Vol 7 No. 2 (1984) *Industry and Environment p. 25.*

49. UNEP; *New Directions in Environmental Legislation and Administration Particularly in Developing Countries,* UNEP, Nairobi, 1989.

50. *Ibid., see also UNEP: Legal and Institutional Arrangements for Environmental Protection and Sustainable Development in Developing Countries.* UNEP, Nairobi, 1990.

51. i.e. Banford v. Tunn by (1863)3 B & S 66; 122 E.R. St. Hellen's Smelting Co. v. Tipping (1865) H.L. Case. 642; 11 E.R. 1483 Southport Corporation v. Esso Petroleum Co. [1953]3 Co. L.R. 773. Leakey V. National Trust for Places of Histonic Interest or Natural Beauty [1980] QB 485. Manchester Corporation V. Fantworth [1930] Act 17. Benjamin v. Stow (1874) L.R. 9 C.P. 400. Hollywood Silver Fox Farm Ltd v. Evett [1936] 2 KB 468.

52. Donoghue V Stevenson (1932) AC.

53. See the case of Imperial Clinical Industries V. Statwell (1965) AC 656)

54. (1808) L.R. 3 HL. 38))

55. Rickard V. Lothian (1911-13) ALL ER 71.

THE POLLUTER-PAYS PRINCIPLE

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I. INTRODUCTION

Pollution abatement legislation in many countries establishes principles to be followed. One of such principles is the commonly known **polluter-pays principle.** The polluter-pays principle simply means that, on the basis of existing regulations and standards, the costs of pollution prevention and control in a given jurisdiction should be borne by the polluters. In some cases, if they are unable to pay, the requirement may be lowered or waived.

For the purpose of reducing ambiguities that may derive from different meanings attached to the *polluter-pays principle,* I have been asked to provide some explanation on this principle, which may also be found in many environmental policy documents. However we should mention here that the definition of concepts in environmental law falls into two broad categories:

- The definition of scientific terms which need to be perceived in such a manner that they actually reflect their commonly established meaning and;

- The clarification of concepts of a legal or general nature which may have some specific or restricted significance in policy, jurisprudence or otherwise.

1.1 Methodology

In light of literature, I will try to identify the various legal perceptions of *the polluter-pays principle* and attempt to outline the meanings related to it. I will also briefly consider some policy indications and alternatives about the principle, and particularly its usefulness and effectiveness and the degree of compliance with it in environmental management. Special reference is made to the concept of environmental liability; a general topic which in various jurisprudence cases, incorporates a dimension of *the polluter- pays principle.*

2. WHAT DOES THE POLLUTER PAYS PRINCIPLE MEAN?

As explained, the *polluter-pays principle* is the [legal] requirement that the costs of pollution should be borne by the person responsible for causing the pollution. The meaning of the *polluter-pays principle* and its application to various cases and situations is subject to various interpretations particularly as regards the nature and extent of costs involved and the circumstances in which the principle can be subject to exceptions.

The principle has been promoted at national and international levels as it relates closely to the rules of civil law and State liability for environmental damage. The practical implications of the principle are the allocation of economic obligations in relation to environmentally damaging activities, particularly with regard to liability, the use of economic instruments and the application of rules relating to competition and subsidy. Examples of specific application of the polluter-pays principle include the adjustment of fees or taxes payable by hazardous installations, as is the case in France, to cover the cost of exceptional measures taken by public authorities to prevent and control accidental pollution, and charging to the polluter the cost of reasonable pollution control measures taken when an accident occurs, particularly to avoid the spread of the damage or limit the release of pollutants, or their ecological effects. Included also are the costs of rehabilitation measures taken to restore the damaged environment.

From the standpoint of protecting the environment, it should be understood that provisions for the application of the polluter pays principle are clearly justified by the understanding of the term polluter and the responsibility [to pay for pollution], which ensues from qualifying a legal person as a polluter. In this context, the considerations which may come to mind relate to how

to define pollution and the conditions for determining pollution.

Many framework laws of African countries actually define pollution. In that respect, one can refer to The Gambia **National environmental Management Act, 1994**, which stipulates at its Section 2:

Interpretation

2. In this Act unless the context otherwise requires,

> *"pollution"* means any direct or indirect alteration of the physical , thermal, chemical, biological, or radioactive properties of any part of the environment by discharging, emitting, or depositing wastes so as to affect any beneficial use adversely, to cause a condition which is hazardous or potentially hazardous to public health, safety, or welfare, or to animals, birds, wildlife, fish or aquatic life, or to plants or to cause a contravention of any condition, limitation, or restriction under this Act.

However, the same law also defines some other relevant words as follows:

"pollutant" means any substance whether liquid, solid or gaseous which directly or indirectly:

(a) alters the quality of any segment or element of the receiving environment so as to affect any beneficial use adversely; or

(b) is hazardous or potentially hazardous to health and includes objectionable odours, radio-activity, noise, vibration, temperature change or physical, chemical or biological change to any segment or element of the environment;

"radiation" includes ionizing radiations and any other radiation likely to have adverse effects on human or animal health and the environment.

"standard" means the limits of pollution established under section 28 or under regulations made pursuant to this Act or any other law.

There is also the **National Environment Statute, 1995 of Uganda** which defines pollution as follows:

Section 22 states: ..."pollution" means any direct or indirect alteration of the physical, thermal, chemical, biological, or radio-active properties of any part of the environment by discharging, emitting, or depositing wastes so as to affect any beneficial use adversely, to cause a condition which is hazardous or potentially hazardous to public health, safety, or welfare, or to animals, birds, wildlife, fish or acquatic life, or to plants to cause a contravention of any condition, limitation, or restriction to which is subject a licence under this Statute.

3. SCOPE OF POLLUTER PAYS PRINCIPLE

The polluter pays principle is a basic principle in the framework of the pollution control strategies at national and international levels. According to the principle as interpreted by many governments and decision-makers, polluters must pay:

- **the cost of pollution abatement,**
- **the costs of environmental rehabilitation, and;**
- **the compensation costs for victims of damages if any, due to pollution.**

The scope of the polluter-pays principle can be understood through the range of compensation mechanisms to victims of environmental damages in the framework, and on the basis, of environmental liability.

These include a range of components or elements to be considered in the application of the principle, such as - the nature of conceptual problems encountered in incorporating these elements or components into the legal system. However, the primary goal of the polluter-pays principle is to achieve and maintain a cleaner environment. The polluter pays principle is particularly valid for giving appropriate remedies to victims of damage from environmentally harmful activities. The law presumes that the permission to carry on an activity is conditional on the enterprise absorbing the cost of any pollution arising from the activity. However other questions arise concerning the consideration of the extent of environmental damage, the need for a reasonable and better compensation for such damage, and the adoption of preventive approaches for better management of environmental resources.

The scope of the *polluter-pays principle* depends on the policy-making context, as it involves many approaches underlying environmental planning (also incorporated in environmental legislation). It is a mechanism for compensation for damage, taking into account its preventive effects.

The polluter-pays principle can be understood within the jurisprudential context. The jurisprudence integrates all the conceptual categories and different goals of strict environmental liability and restitution for environmental damage in order to ensure that an enterprise which is engaged in a hazardous or inherently dangerous industry which poses a potential threat to the health and safety of the working persons in the premises and those residing in the surrounding areas owes an absolute and non-delegable duty to the community to compensate for such harm.

The scope of the polluter-pays principle can also be understood within the economic context as the approaches involved promote the integration of the costs of environmental degradation. In this regard, Principle 16 of the Rio Declaration states that:

> **«National authorities should endeavour to promote the internationalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should in principle bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment».**

4. TOWARDS THE PROMOTION OF THE POLLUTER PAYS PRINCIPLE

Legal and administrative responsibilities for pollution control usually rests with national authorities which are charged with enforcement of national legislation and standards as established.

As mentioned above, at the national level, the polluter-pays principle is introduced as an obligation for States to promote the development of attitudes that prevent environmental pollution and other environmental damage through national legislation which incorporates the internalization of externalities. However, the polluter-pays principle does not have as much support as other principles of the same nature of general application. Its further development has often run into objections. However, the increased attention paid to the *polluter-pays principle* is a consequence of the consideration given to the relationship between environmental protection and economic development, and of the recent efforts to use economic instruments in environmental law and policy. Indeed, the 1990 Ministerial Declaration of the Second World Climate Conference illustrates the need for a new regulatory approach which promotes the use of economic incentives or instruments and integration of pollution prevention. It states that:

> **"....Appropriate economic instruments may offer the potential for achieving environmental improvements in a cost effective manner".**

As with many other principles, there is, at present, no comprehensive and authoritative definition of the polluter-pays principle. The polluter-pays principle is among the strategies in the legal and administrative field which was identified as significant to the future of international environmental law, particularly in the framework of the Montevideo Programme on the Development and Periodic Review of Environmental Law. As a general principle, it is considered as applicable to the formation and development of environmental law during the present decade. The polluter-pays principle is also an expression which is actually used in international declarations, including the Rio Declaration [Principle 7].

Through Principle 22, the Stokholm Declaration also underpins the polluter pays principle.

However, in none of these declarations is the principle comprehensively defined, although many documents of a legal nature describe what the principle is intended to mean in the context of the subject matter concerned.

European Community law also reaffirms the polluter-pays principle and provides that: *"Community policy on the environment shall be based on the principles — that the polluter should pay."*

Another recomendation of the European Community also imposes the application of the polluter-pays principle. It reads:

> **"natural and legal persons governed by public or private law who are responsible for pollution must pay the cost of such measures as are necessary to eliminate that pollution or to reduce it so as to comply with the standards or equivalent measures laid down by the public authorities."**

The polluter pays principle is also considered in certain international conventions such as the Convention on the Law of the Sea, [particularly in the framework of Section 9 on responsibility and liability, Article 235].

At the national level, a variety of framework laws of many African countries actually contain provisions relating to the polluter pays principle. A case in point is Section 39 of the National Environment Management Act of The Gambia which stipulates:

Prohibition of Pollution

Section 39.(1) *No person shall pollute or permit any other person to pollute the environment in excess of any standards or guidelines established under section 28.*

(2) A person who pollutes or permits any other person to pollute the environment in excess of any standards and guidelines established under this Act commits an offence.

(3) In addition of any sentence that may be imposed upon a polluter under sub-section (2) the Court shall require such person.

(a) to pay the full cost of cleaning up the environment and of removing the effects of the pollution; or

(b) to clean up the environment and remove the effects of the pollution.

(4) Without prejudice to the provisions of sub-sections (2), and (3) the Court may also require the polluter to meet the costs of the pollution to third parties through compensation, restoration or restitution." End of quote.

The polluter-pays principle is also contained in the Cape Verde's Order No.86/IV/93 of 26 June 1993 art.3 par.i). which ...*«defines the principle as a responsibility of agents for the consequences to third parties of their direct or indirect actions on natural resources, whereby the polluter is obliged, at his cost, to correct or rehabilitate the environment, and prevented from continuing the polluting action».*

The Environmental Management Act of Malawi, which was promulgated on the 5th August 1996 also states at its Section 43 (3) that the minister may:

..."prescribe such fees as he shall deem necessary for the monitoring, clean up, removing or disposing of pollutants discharged or emitted into the environment"

5. OTHER POLICY ALTERNATIVES TO THE POLLUTER PAYS PRINCIPLE

There are several policy approaches to environmental pollution control. The first approach is direct regulation and control. Here, the government can decide what each polluter must do to reduce pollution by setting certain uniform standards and subjecting violators to legal penalties. But according to many policy-makers, and to experience, this approach is not fair when one considers the conditions in which each polluter operates. It is not efficient either because effluents and damage also differ.

The second approach is the fixing of charges for various levels of pollution, in order that the users bear the cost of pollution prevention and control measures. Economists prefer this approach as well as the polluter-pay principle because they believe that pollution results from a failure of the pricing system and that the best way to correct the failure is through the system itself.

The third category of such approaches involves the enforcement of torts and property rights through the judiciary. Indeed, under torts, a pollution victim can seek redress in court for damage suffered. This method is effective when the identity of the affected party is known, but the assignable damage might be ambiguous in many cases. Under property rights the government creates and gives rights either to the polluters who then have rights to discharge pollutants into the environment or its components, or to the potential victims who then have rights to preclude anyone from discharging effluents.

The fourth approach is one consisting of substantial subsidy for individual treatment.

However, the implementation of these strategies requires much information on technology of each industry to enable regulation. Polluters also respond differently to these approaches in their own interest. Some find it cheaper for example to pay a pollution tax, while others might reduce pollution or avoid charges by using different raw materials or resorting to improved energy consumption.

6. ENVIRONMENTAL LIABILITY AND THE POLLUTER PAYS PRINCIPLE

Environmental liability is a legal concept whereby damage to the environment can be determined, assessed and redressed through the rule of law. Environmental legislation creates obligations which give rise to liability for environmental damage, including pollution and nuisances and the consequences of irrational use of environmental resources or technologies.

The effectiveness of the **polluter-pays principle** as a judicial mechanism applied to the protection of the environment depends on the ability of the liable party to pay the cost of compensation, as well as on the available alternatives. As a major component of environmental liability, the **polluter-pays principle** includes the mechanisms by which responsibilities are engaged in the context of the rights and obligations provided by laws.

Under traditional jurisprudence, civil liability is a mechanism of compensation based on the existence of damage. This means that unless damage has occurred, there is no liability. In the area of environmental law, liability can be based either on negligence, ie on fault, or on the degree of nuisance.

The prerequisites for strict liability are:

(1) Damage to a property or a person and;

(2) Causality between damage and an action or activity.

Another condition would be that the legal rule should provide that the action from which the damage derived is prohibited or controlled, that the citizens have had notice of the legal rule prohibiting or controlling such an action, and are aware of the possible consequences of non-compliance with the rule. In other words, liability based on negligence requires proof that the environmental damage was foreseeable, that the party whose action or activity caused the damage had a legal duty of care to prevent the damage and that he failed in that duty.

Liability based on nuisance requires proof that property was used in such a way that it caused serious disturbance or substantial inconvenience to a neighbour's property. The owner or the occupier of the site on which the nuisance occurred can be held liable, but only if the use of property was unreasonable.

The common law basis for strict liability comes from a case dating back to 1868, which is commonly known as Rylands v. Fletcher. In the African context, two general observations can be drawn from the historical background of environmental law as regards liability:

i) Civil codes and framework environmental laws of many African countries contain various provisions on environmental liability. However, little is found in most of them about the types of damage which are likely to give rise to legal action that will lead in turn to the obligation to pay compensation or ensure environmental clean up. The legal uncertainty about the scope of private responsibility for environmental damage is a fundamental problem in the legal systems of African countries.

ii) Applications of civil liability principles to environmental damage bridge two currents of environmental legislation of African countries:

   - One current is found in private law, where principles of property rights and contract obligations evolve into mechanisms for allocation of individual responsibility for environmental problems.

   - The other current has developed under public law, where legislation and implementing regulations establish standards and guidance for managing and protecting the natural resources which are deemed public, including the public interest in the quality of the environment. Public and private law concepts often interact in the context of environmental liability.

However, a political dimension comes into this subject when we have to consider the liabil-

ity of the government as it holds the role of a regulator, and sometimes of an entrepreneur. Indeed, government agencies are subject to tort liability, except if stated otherwise.

Environmental liability in relation to compliance with the provisions of environmental conventions and their enforcement mechanisms remains an important issue whose complexity and interdependence needs new approaches.

In spite of the high number of international conventions and treaties, their effectiveness in solving environmental problems remains a particular concern. Many conventions provide supervisory mechanisms to ensure compliance. Other conventions contain provisions relating to State responsibility. However, such responsibility is absolute and States cannot evoke reasons such as lack of time or capacity to fulfil their obligations.

7. CONCLUSION

Liability for non-observance of the obligations imposed by environmental provisions represents rather a complex issue. The non-observance of environmental law provisions brings about civil or criminal liability that involve specific sanctions determined by law, including imprisonment, financial compensation and rehabilitation of the degraded environment in the framework of the polluter-pays principle.

SELF REGULATION AND CO-REGULATION
Cost-Effective Policy Options for Industrial Sustainable Development

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If sustainable industrial development is to be achieved in developing countries greater focus should be given by policy makers to the introduction of self-regulatory and co-regulatory policy instruments. Such instruments are not only effective in promoting the integration of developmental and environmental objectives (by coordinating the strategic priorities of government and business), but they also overcome a number of the evident shortcomings associated with the traditional regulatory approaches. This paper summarises some of the key arguments and issues associated with self-regulatory and co-regulatory policy instruments.

1. It is important to appreciate that self-regulatory and co-regulatory policy instruments should not be seen as stand-alone policy options, but rather as instruments that work in conjunction with other policy options. A useful typology of environmental policy instruments is presented in Box 1 which presents three key policy types.

   – Directive-based regulation (often known as "command-and-control")

   – Incentive-based strategies (or "market-based instruments")

   – Information-based strategies

2. Examples of effective self-regulatory mechanisms (i.e industry run initiatives) include:

   - Environmental Management System standards, e.g., ISO 140001, EMAS etc;

   - International industry association initiatives, e.g., ICC Charter, Responsible Care

   - Local industry initiatives: IEF, CAIA, PACSA (monitoring and reporting)

3. Examples of co-regulatory initiatives (i.e joint government and industry initiatives) include:

   - Negotiated agreements, e.g. the Dutch covenant system;

   - The US EPA's adoption of voluntary mechanisms, eg Green Lights, 33-50, Waste Wi$e etc;

   - Flexible penalty schemes for voluntary disclosure.

4. Some key points about self-regulation and co-regulation are:

   - They must be seen to operate in conjunction with traditional regulatory mechanisms;

   - There is a need to identify and enhance the "motivating factors" which make the implementation of environmental management practices to be in industry's interest (see point 7 below);

   - Ideally business and government should together agree on the priorities in environmental management, with business being given the flexibility to address the agreed priorities on as cost-effectively a basis as is possible.

5. The advantages of self-regulatory and co-regulatory policy instruments are:

5. The advantages of self-regulatory and co-regulatory policy instruments are:

   - They are based on close consultation between government and business, rather than on an adversarial approach, thus facilitating better co-ordination of environmental and economic policies;
   - They avoid the pitfalls of directive-based regulations (see point 6 and Box 2);
   - They are less reliant on scarce government resources, whether manpower, finance, or technical;
   - They make use of the profit motive, and of business initiative and expertise, and give business the flexibility to prevent pollution as effectively as is possible, and thus promote innovation and improvement.

6. Some of the shortcomings of "command-and-control" regulation are:

   - They are generally inflexible land inefficient especially with technology-based standards;
   - They are characterised by their adversarial nature;
   - They are often media-specific with an end-of-pipe focus;
   - They are dependent upon effective enforcement, which in turn requires adequate staffing, technical and financial resources, as well as considerable political will.

7. The motivating factors for self-regulation are:

   - The prospect of government action to introduce new legislation which would be costly to implement;
   - Customer demands and consumer pressure, e.g. Responsible Care;
   - Technical and marketing benefits which are associated with participation in voluntary programmes;
   - An appreciation of cost savings to be achieved through sound environmental management;
   - Public and peer pressure; this needs well structured sectoral groups and vocal NGOs/consumers;
   - A requirement to disclose environmental information; - An appreciation of environmental concerns

8. The government's role in relation to such instruments is to:

   - Set negotiated performance standards without mandating the means of compliance:
   - Create incentives and institutional support which enhance pressures for self-regulation;
   - Develop mechanisms to ensure transparency in reporting progress;
   - Undertake random monitoring of "self-audit reports" with strict sanctions against free-riders;
   - Provide information and assistance in the promotion of voluntary programmes;
   - Promote and facilitate interaction between the business and community sectors.

9. Industry's role in relation to self-regulatory and co-regulatory instruments is to:

   - Meet negotiated standards through its own cost-effective initiatives;
   - Undertake regular auditing (i.e self-policing) and reporting;
   - Make a commitment to a more comprehensive and open reporting system;
   - Ensure the further development and implementation of industry sectoral associations and initiatives;
   - Implement its own deterrent sanctions against non-performance (e.g. market discrimination, removal from association membership etc).

10. The ways of introducing "negotiated self-regulation" in developing countries include to:

    - Develop a shared vision between government and business on the main environmental priorities;
    - Agree on key objectives and targets, and on methods of ensuring transparency;
    - Maintain mutual trust through open dialogue and negotiation;
    - Consider the development of voluntary agreements (like the USA's EPA instruments, eg Green Lights etc);
    - Examine the use of negotiated agreements, e.g. the Dutch Covenant system;
    - Promote auditable environmental management systems throughout business;
    - Reach agreement on transparent reporting methodology and key environmental indicators;
    - Encourage "self-policing" by reducing penalties in cases of voluntary disclosure and correction;
    - Ensure the implementation of strict sanctions against free-riders;
    - Investigate the greater use of economic incentives

11. Negotiated Agreements as a form of co-regulation:

    - It is important to note the widespread adoption in the EU and globally, especially as part of the Dutch NEPP of negotiated agreements;
    - They have an important potential role in developing countries, even though they are dependent on the presence of the right conditions;
    - They are thought to have considerable merit as a means for achieving generally agreed nationally established targets.

    The institutional conditions for their success are:

    - Sufficient business and government motivation and trust;
    - A high level of political, industrial and social environmental awareness;
    - Access to baseline data for setting targets;
    - An ability to control free-riders;
    - A positive incentive to participate;

    The procedural conditions for their success could be covered in a Code of Conduct, and include:

    - Quantified, unambiguous targets, with milestone targets and deadline dates;
    - A procedure for the participation of key stakeholders;
    - A procedure for monitoring and evaluating performance;
    - A clear definition of parties' roles, responsibilities and cost allocations;
    - A procedure for public reporting of performance.

Box 1 - Environmental Policy Options : A summary

Environmental policy instruments are typically distinguished in terms of the degree to which the state is involved in the development and implementation of that instrument. A related distinction is presented in Figure 1 which lists a variety of instruments ranging from those that mandate specific behaviour to those that focus on information-based strategies. The following groups of policy approaches are listed in terms of that ranking.

Directive-based regulation: This refers to the traditional use of government regulations whereby a public authority sets standards, monitors and enforces compliance with these standards, and punishes transgressions. There are various types of environmental standards, including ambient environmental quality standards, effluent and emission standards, technology based standards, performance standards, and product and process standards.

Economic instruments: These are efforts to encourage beneficial behaviour by altering the prices of resources and of goods and services in the marketplace, so that they more accurately reflect the environmental costs of production and/or consumption. Examples include pollution taxes, tradable pollution permits, and deposit-refund schemes.

Liability reform: There is a trend in a number of legal regimes towards the imposition of strict liability for environmental damage, in terms of which a corporate entity that is shown to be a source of environmental damage is required to remedy the damage irrespective of any due diligence efforts that the entity may have taken.

Co-regulatory instruments: These cover a variety of initiatives where the interactive relationship between the regulator and the regulated is particularly close. Typically, in terms of the co-regulatory approach, the environmental objectives are set by the public authorities, while the methods in achieving those objective are determined by the regulated industry. Although this may be seen to cover some of the policy approaches listed here, it refers in particular to initiatives such as negotiated agreements.

Information-based instruments: These include measures taken to enhance awareness on environmental issues, such as technical assistance programmes, advertising, eco-labelling, performance reporting, group empowerment programmes and small business incentive schemes.

Self-regulatory instruments: These refer to systems of self-discipline that is adopted by business to be able to retain acceptance in the market place and develop a competitive advantage. This discipline is self-imposed, without direct government intervention, and involves industry voluntarily choosing both the environmental target and the measures for achieving that target. Examples include the chemical industry's Responsible Care initiative and the ISO 14000 series of standards. Two major concerns with such an approach are free-riding and the problem of lack of credibility.

Box 2 - Shifting Responsibility For Implementation On The Regulated Party

Examples of co-regulatory and self-regulatory policy instruments

There are a variety of co-regulatory and self-regulatory instruments that have been implemented as a means of achieving environmental objectives. Listing them (roughly) in an order that reflects the degree of government involvement (from the highest to the lowest levels), the instruments include for example:

- The development and implementation of *negotiated agreements*. These are agreements that are entered into between regulatory agencies and private sector enterprises or sectoral organisations, in terms of which the latter undertakes to meet certain environmental commitments.
- The introduction of *reporting and disclosure requirements*. These emphasise the positive potential role of information in promoting preventative action, building on the experiences of using Pollution Release and Transfer Registers (PRTRs) in places such as the USA, Canada, Australia and the UK, as well as the requirements for mandatory environmental reporting in Denmark.
- Policy measures that promote more widespread adoption of auditable *EMS standards* (such as the ISO 14000 series). These standards, which have been drawn up, and are being implemented voluntarily by many in the business community, provide a framework for improving environmental management and performance. Government has a useful potential role in promoting the more widespread adoption of auditable environmental management systems as a possible means of minimising the need for government inspections by, for example, introducing flexible penalty systems to assist in promoting the adoption of internationally recognised accreditation systems, as well as ensuring that future updates of EMS standards have an increased emphasis on cleaner production and improved performance aspects.
- Related to this is the suggestion for introducing *self-auditing and voluntary disclosure* through the application by government of flexible penalty options, an approach that has been applied in, for example, the USA. In seeking to pursue such initiatives further, it is important to assess their success in encouraging more open reporting by industry, and thus shifting some of the resource implications of environmental enforcement away from government towards the private sector;
- The introduction by the *US Environmental Protection Agency* of numerous *voluntary programmes* (such as 33/50, waste Wi$e, and Green Lights) all of which seek to achieve significant environmental benefits beyond what the law requires. By participating in these environmental programmes companies benefit through improved public recognition, access to technical assistance from the EPA, cost savings, and the longer-term rewards associated with innovation. Two such initiatives have recently been introduced in South Africa with a view to simultaneously curbing greenhouse gases and promoting economic development: these are the Clean Commute and Green Buildings for Africa programmes, that were launched in May 1997.
- The promotion of *eco-labelling* and consumer education schemes as a means of facilitating more sustainable consumption patterns. Although eco-labelling schemes are increasingly implemented in OECD countries, they do not appear to be particularly evident in developing regions, a possible reason being that the power of consumer choice remains largely a luxury, being dependent upon the presence of a well informed and comparatively well off consumer body;
- the adoption of *Life-Cycle Analysis* as a means of facilitating prioritised policy-making. The use of LCA is of particular potential value in improving decision-making and prioritising environmental actions, by government business and the consumer. It remains however a somewhat imperfect tool.
- The introduction by industry sectors of their own *codes of environmental practice*, such as:
  - the ICC's *Business Charter for Sustainable Development*,
  - the chemical industry's *Responsible Care* Programme
  - the Japanese business sector's *Keidanren Global Environmental Charter*
- In South Africa, environmental initiatives are being undertaken by bodies such as:
  - the *Industrial Environmental Forum of Southern Africa (IEF)*;
  - the *Chemical & Allied Industries Association (CALA)*;
  - the *packaging Council of South Africa (PACSA)*;

While some of the above listed business programmes require detailed reporting of progress in implementing agreed codes of practices, with the threat of some form of sanction for failure to do so, many initiatives are still entirely voluntary and rely principally on peer pressure to induce improved performance. For these industry codes to be effective, mechanisms need to be in place to promote members' implementation of the code, to monitor and publicly report on adherence, and to have meaningful sanction in addition simply to peer pressure. It must be acknowledged that this is not always the case, this being a criticism that in particular has been levied against the ICC Charter.

Table 1: Brief Comparison of Generic Environmental Policy Instruments

This table is derived from an analysis in McKinsey & Co.

	Directive-based regulation	**Incentive-based regulation**	**Industry self-regulation**
Advantages	Well known and understood by various stakeholders Relatively high degree of surety of results Most effective in single source/substance situations	Flexible, and usually more cost-effective Promotes technological development Effective if pollutants are widely dispersed	Potentially the most cost-effective approach Highly flexible Makes direct use of industry's informational advantages
Effectiveness barriers	International standards are difficult to design & enforce Problematic in the case of dynamic multi-source and multi-substance issues Often too late	Problem may be inappropriate for market solution May be difficult and time consuming to structure the appropriate instrument	Problem may exceed the capacity of single industry sector to solve Consensus for industry investment in self-regulation may not exist
Efficiency barriers	Compliance often very expensive Generally very inflexible Dependent on adequate enforcement capacity	Difficult to predict the cost-benefit relationship and thus to ascertain the appropriate incentive May be difficult to enforce	May be difficult to police, especially in the instance of free-riders
Equatability barriers	May expose competitors to different compliance costs May prejudice new entrants	Can be regressive on single-focus (product) producers May prejudice new entrants Distribution of permits mat favour dirty industries over cleaner industries	Economic and competitive inequalities may result from the problem of free-riders

These diagrams summarise some of the findings of an investigation of the process of environmental policy making in six OECD countries, focusing in particular on the impact of the relationship between industry and the regulator on the development of an effective environmental policy (i.e. policy that promotes responsible industrial innovation). The possible relationships are summarised in a matrix comprising two factors: the political independence of the regulator, and the quality of dialogue between the regulator and industry. It is argued that the focus of policy reform in developing countries should be on facilitating a transfer towards a "responsible innovator" strategy, rather than on introducing aggressive adversarial regulation. Building on the experience of, for example, the Netherlands in trying to achieve a sustainable economy, it is suggested that a first step in policy-making for sustainability is to reach agreement on long-term developmental objectives, involving all stakeholders. This is likely to create a stable and consistent policy framework, which has general public acceptance, and which formalises government's political independence from industry. Using the above matrix, it is argued that a sustainable economy plan limits the strategic space to the area of high political independence, while negotiated agreements formalise a high level of dialogue and trust between industry and the regulator. In combination, the use of negotiated agreements and a sustainable economy plan ensure the adoption of a "responsible innovator strategy".

Box 3 - South African environmental law:
Demonstrating the weakness of directive-based regulation

Although South Africa has both a strong common law tradition as well as a number of well intentioned and appropriately structured environmental statutes - which in many instances provide for standards that are comparable with those adopted internationally - the good intent and potential of the law in achieving environmental objectives has largely not been realised. There are a number of widely acknowledged reasons as to why environmental law in South Africa has not lived up to its potential, many of which arguably are common throughout developing countries:

- There is excessive *fragmentation of the laws*, both with regard to their subject matter and to their administration, with a number of different agencies being responsible for pollution control without any effective co-ordination.
- Environmental law is ***not sufficiently enforced***, largely as a result of a shortage of suitably qualified and committed inspectors, government lawyers and administrators. The lack of capacity within government is evident at both national and provincial level, although is particularly pertinent in the provinces where the general administrative capacity is described as being at a "crisis level".
- The problem of inadequate enforcement has been compounded by the *lack of sufficiently deterrent sanctions*, with fines and sentencing provisions being very lenient by international standards.
- Historically there has been a tradition of ***insufficient disclosure of corporate environmental information***; this situation has however since been improved in terms of the Right of Access to Information Clause of the new Constitution (pending approval of the Open Democracy Bill);
- An additional problem that has compounded the application of environmental law in South Africa has been that of ***strict locus standi requirements***, although again this issue has to some extent been addressed in terms of provisions within the new Constitution.
- The focus of much of many of the environmental permits issued in South Africa has been primarily on setting ***individual site-based discharge standards*** without sufficient reference to any long-term ambient environmental standards. It is suggested that if sustainability is to be achieved, then it is essential that standards are set on a prioritised basis with due consideration to long term objectives.
- Environmental regulations in South Africa have generally formed part of a series of *end-of-pipe media-specific laws*;
- The principle of *"best practicable means"* has traditionally been applied, thereby demonstrating a general ***primacy of technical and economic considerations*** over the environment. This is particularly evident in the case of atmospheric pollution control, where standards for air pollution are decided by the chief air pollution control officer in consultation with the polluting industry, with (historically) little opportunity for meaningful challenge by environmentally concerned citizens.
- The current system of setting and enforcing standards, is subject to the usual inefficiencies associated with "command-and-control" approaches, arising from the fact that such standards are ***generally inflexible***, tend to ***discourage technological innovation***, and require the regulator to ***use scarce public resources*** to obtain information that is already available to the polluter.
- The development and implementation of an integrated approach to environmental issues in South Africa has been compounded by a ***lack of political power and sufficiently strong leadership*** in the Department of Environmental Affairs and Tourism, which has rarely challenged any environmentally unsound activities or decisions of other government departments; arguably this has been reflective of the generally low priority given to environmental issues within the South Africa government (past or present);

Most of these historical problems with environmental regulation in South Africa are well appreciated, and efforts continue to be taken to address them as part of the current environmental policy reform process. Despite the various initiatives, it is submitted that an underlying cause of the ineffectual implementation of environmental law in South Africa - namely insufficient institutional capacity at both national and provincial level - is likely to remain a problem for some time, notwithstanding the efforts being devoted to environmental "capacity building" in a number of the provinces, with the assistance of international aid agencies. The acute problem of government capacity has recently been emphasised in South Africa following an investigation into the administrative capacity in the provinces, which maintains that it will take at least ten years to build the necessary management skills throughout the provincial public sector. This is likely to remain a particular problem with respect to environmental issues which continue to receive a low priority in terms of central government funding.

Introducing Negotiated Agreements in Developing Countries: A checklist of conditions

This table presents a list of basic conditions for the successful introduction of negotiated agreements, a prime example of a co-regulatory policy instrument. The conditions (both "institutional" and "procedural") have been divided according to whether they relate to sustainability (i.e. environmental effectiveness), equity or efficiency - three key policy criteria for evaluating the achievement of sustainable development. This distinction should not be seen as absolute: in some instances conditions may pertain to more than one of these policy criteria (such as e.g. free riding), or alternatively they do not fall neatly within any of the criteria. Similarly, the distinction between institutional and procedural conditions should be interpreted with some flexibility. The table provides some general comment with regard to each condition with a view to evaluating whether or not negotiated agreements may be introduced in developing countries.

Performance Criteria	Conditions	General Comments
Sustainability (Environmental Effectiveness)	***Institutional Conditions:*** Sufficient business & government motivation for using negotiated agreements Mutual trust between parties and other key stakeholders High level of political, industrial & social environmental awareness Access to adequate baseline data for setting targets Availability of pre-determined goals, preferably as part of a national strategy for sustainability Sufficient ability to control free-riders - Credible threat of legal or fiscal sanction - Proactive, sectoral organisations - Active & sufficiently resourced public interest groups - Existence of consumer pressures Positive incentive to participate - Availability of information and technical assistance	The institutional conditions relating to "sustainability" are the usual basis for the suggestion that negotiated agreements cannot be introduced in states lacking "a mature environmental policy". This refers in particular to the need for a tradition of strict legal enforcement, as well as to the existence of mutual trust between the various parties. The argument is made in this chapter that despite (indeed to some extent because of) a history of poorly enforced law, there is nevertheless good reason to believe that agreements are a viable policy tool, provided in particular that procedures are in place for effective information disclosure and that there are alternative credible pressures for implementation. In this regard the composition and power of sectoral groups in an important factor. As a means both of promoting trust and of contributing to the achievement of sustainability, the need for a "shared vision" as to the preferred developmental path is also of importance. It is suggested that the effective use of negotiated agreements will in themselves assist in enhancing the level of trust between the various parties, as well as contributing to an improved level of environmental awareness, particularly when used in conjunction with "no regrets" policies.

Performance Criteria	Conditions	General Comments
	Procedural Conditions: Quantified unambiguous targets Ambitious yet sufficiently attainable targets Milestone targets Implementation timetable with deadline dates Procedure for monitoring and evaluating performance Credible verification system	This list of procedural requirements are all issues that should be provided for within the agreement itself. A useful description of the minimum content of an agreement is provided for within the Dutch Code of Conduct (Box 17). It is suggested that consideration should be given to developing either a guideline document or a specific legal procedure for use in South Africa, ensuring amongst other things that the requirements in the recent White Paper on Environmental Policy are specifically provided for.
Social Acceptability	**Institutional Conditions:** Public credibility of parties - Representativeness of parties - Participation and consultation - Experience in negotiation and developing agreements	The key issues relate to the availability of structures for ensuring the effective participation of interested stakeholder, as well as the credibility of performance reports. This emphasises the importance of independently set targets, as well as the possible need for a verification body to add creditability to monitoring and reporting.
	Ability of external parties to influence content of agreement Competent intermediaries, arbitration or mediation	On the issue of creditability the UK experience with the failed packaging agreement is pertinent, one of the issues being the lack of representativeness and low credibility of the parties. A clear procedure for the participation of stakeholders is also essential.
	Procedural Conditions: Definition of rights, extent, conditions and procedures for stakeholder participation Provision for procedural guarantees or formalised consultation with third parties Parties clearly defined with clarity as to roles and responsibilities Level, type, public availability & frequency of reporting specified Disputer resolution procedures Justification of choice of policy instrument	See comments pertaining to procedural conditions for sustainability above. In addition to developing a guideline, or possible Code of Conduct, that makes explicit provision for a consultative procedure, it is suggested that consideration should also be given to ensuring that the conclusion of any agreements is suitably publicised (by, for example, reporting in the Government Gazette).

Performance Criteria	Conditions	General Comments
Economic Efficiency	*Institutional Conditions:* Clarity regarding the costs associated with developing and administering the agreement General appreciation of costs in implementing the agreement, as well as an understanding of division of costs between government and industry, and within industry sectors Ability to integrate technology innovation requirements with other policy objectives Mechanisms for protecting trade information and market competitiveness	Unlike the sustainability conditions, the "institutional issues" relating to economic efficiency refer largely to activities to be undertaken, rather than to the nature of existing institutional structures. For this reason it is suggested that the conditions may be generally easier to fulfil. This is not however to deny the importance or complexities in assessing the economic costs and benefits associated with agreements. The role of an external body (such as the Dutch Novem) is raised as a possible means of protecting trade secrets.
	Procedural Conditions: Clarity on method for cost allocation between parties Provision for extension and/or amendment to agreement Clarity as to whether absolute or specific targets Criteria established for evaluating the ongoing efficacy of the agreement	See comments pertaining to procedural conditions for Sustainability.

ENVIRONMENTAL LAW — A STRATEGIC ISSUE FOR INDUSTRY

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1. INTRODUCTION

The purpose of this paper is to discuss environmental law as a strategic issue for industry. An increase in the awareness of the environment and the impact of industrial development on the environment has resulted in various international and national environmental policies and initiatives. These policies and initiatives are taking the form of environmental trends which are affecting legal systems internationally. Both the trends themselves and the impact the trends are having on environmental law must be considered by industry. In this paper we will provide some details on global trends affecting environmental law, the effect this will have on industry and how industry can manage the risks created by the increase in environmental awareness.

2. GLOBAL ENVIRONMENTAL TRENDS AND THE EFFECTS ON LEGAL SYSTEMS

• *The rise of environmental consciousness*

Over the past three decades the cumulative effects of systematic over-exploitation of natural resources and unbridled economic development have become evident, particularly in industrialised countries, resulting in a ground swell of popular support for measures to protect the environment. There is strong evidence to suggest that the rise of this "green" consciousness is not merely a passing fad but rather a fundamental change in the way we understand the world. Environmentalists occupy the moral high ground and companies which fail to demonstrate green credentials are increasingly being stigmatised.

This rise in environmental consciousness has been both the cause and the effect of a number of international trends which have increased pressure on governments to promulgate and implement legislation to prevent further environmental degradation. The result has been a dramatic increase in the volume of international and municipal environmental law over the past 30 years.

• *The growth of international environmental law*

Pollution does not respect national boundaries and numerous environmental issues such as the depletion of the ozone layer, global warming and the pollution and over-fishing of the high seas, are not capable of being resolved at national level. This has led to an increasing degree of co-operation on environmental issues at an international level and the development of international environmental law in the form of international treaties. Certain of these treaties specifically require that States Parties who are signatories enact legislation incorporating the essential elements of the treaties and giving them effect in national law.

• *World Trade And The Environment*

There has been a fundamental change in attitude from the free-trade ideal subscribed to in the 70's and 80's, to the current recognition of the importance of the environment and the principle of sustainable development. Environmental concerns are affecting international trade. Consumers, especially in developed countries, are increasingly making choices on the basis of the environmental impact of a product. While the emphasis has traditionally been placed on the products themselves, processes involved in manufacturing a product are now also coming under the spotlight and governments are imposing restrictions on what can be imported into their countries based on the environmental impact of a product and the impact of the process of manufacturing such product.

The European Union for instance has used domestic regulations quite successfully to control the import of products which may be environmentally damaging. International bodies, such as the World Trade Organisation (W.T.O) and the International Standards Organisation (ISO), are formulating agreements that regulate the environmental aspects of trade.[0]

The tightening of standards and the increase in environmentally related trade barriers will affect trade in Africa. International pressures may force exporters to improve their environmental standards but it will have the effect of excluding exporters from developing countries and providing protection for the more advanced, developed countries. In her book "The Bottom Line: Industry and the Environment in South Africa," Lael Bethlehem asks, "do exporters in developing countries have the financial, human and technological resources to meet the new environmental requirements? Will the environmental agenda prove to be a catalyst that raises standards in the South, or a constraint to developing country exporters?"[1]

In the GATT (now the World Trade Organisation) context, the conflict between free trade policies and the need to protect the environment is graphically illustrated in the "Finding of the GATT Dispute Settlement Panel on the Legality of Certain Restrictions on Tuna Imports Imposed by the United States."[2] In essence, the GATT Panel concluded that certain measures introduced by the United States to restrict imports of Mexican Tuna which had been caught using methods which resulted in the death of a large number of dolphins, were incompatible with GATT. The decision of the panel supported free-trade above environmental considerations, Mexico, however, decided not to pursue the case and the Panel's report was never adopted. Mexico and the United States held their own bilateral consultations aimed at reaching agreement outside GATT. Agreement was reached whereby Mexico was effectively required to comply with the US standards, and the ban ultimately achieved the required results.

The Panel also confirmed that the US was entitled to require imported products to be labelled regarding environmental information where this was required of domestic products. This could have a huge effect on export-reliant industries where products are subject to environmentally related public scrutiny and awareness in the importing country. It may make economic sense, therefore, to conform to the environmental standards and laws of developed countries than depend on an importing country's duties under international trade agreements.

The positive side to this scenario is that in developing countries the adoption of cleaner production processes, when developing an industry, in such a country may be an opportunity for developing countries to "leapfrog" over more established industries in developed countries which are still saddled with costly pollution control technologies. The implementation of cleaner processes and environmental management systems can harness corporate momentum to implement cleaner production on a continuous basis, leading to both environmental and economic benefits.

The way in which companies in Africa react to international trade pressures may well determine whether such trade barriers amount to barriers or a competitive edge for developing countries.

- *Economic Trends*

From an economic point of view the environment provides a range of valuable services and resources. The services and natural resources provided by the environment have never been accounted for and the cost of environmental degradation has been borne by society as a whole. One of the consequences of the rise of environmental consciousness has been an attempt to rectify the market failure by "valuing" the services and resources provided by the environment, so that the allocation of scarce resources can be made on an appropriate economic and social basis.

Once the use of environmental resources and services has been valued and the total economic cost of environmental degradation determined, this must be "internalised" and a more realistic price given to the product manufactured by the polluting industry. This process is referred to as internalising externalities. Public interest in environmental matters has generated pressure on governments to promulgate and implement legislation to impose the costs of remedial action and of enforcing environmental regulatory requirements on parties responsible for damaging the environment.

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[0] The Bottom Line: Industry and the Environment in South Africa, Bethlehem and Goldblatt, 1997 UCT Press, p70

[1] The Bottom Line: Industry and the Environment in South Africa, p70

[2] GATT document DS21/R, 3 September 1991

In Denmark, for instance, legislation was enacted requiring certain companies to keep track of how much sewage, smoke and other polluting material they release into the environment, and to report on the quantity of gas and oil used. While Denmark is a leader in Europe in adopting such measures several other European Union countries are contemplating similar action. Danfoss, a Danish multinational has made environmental reports on a voluntary basis for years. As a result it has cut down on water and electricity expenditure by more than 25% in less than a decade.[3]

There are, therefore, incentives for companies to improve their environmental performance and to compile voluntary environmental reports which reflect such improvement. At a UNEP conference held recently in New York, bankers, financial experts and NGOs, as well as discussing strategies to create market incentives, explored the possibility of creating standards for measuring environmental performance by industry.

• *Economic Instruments*

The traditional approach to regulating environmental transgressions has been the command and control method which focuses on compliance, enforcement and punishment. Increasingly, however, there is support within various international organisations for the use of a variety of economic instruments to create incentives for industry to develop cost-effective ways of attaining environmentally desirable objectives. These may take a variety of forms including effluent charges, performance bonds and tradable permits.

The latter concept was developed in the United States and has resulted in schemes which create a notional "bubble" enclosing a particular area. Acceptable pollution levels within the bubble are determined and polluters within the area are given a certain quota to discharge emissions into the atmosphere. The scheme is designed to ensure that the desired target is achieved, at the least total cost to society, since polluters who can cheaply reduce the volume of their discharge will do so and are then entitled to sell the balance of their pollution quota to another polluter whose abatement costs are higher.

There are moves to utilise this concept internationally. A number of United Nations Agency for Trade and Development (UNCTAD) members are promoting a scheme for international trading in emissions of greenhouse gases linked to climate change.[4]

Fines, however, remain a popular way of punishing non-compliance with environmental regulatory law. The British government for instance, is currently drawing up plans for increases in fines for companies that persistently pollute the environment or violate health and safety standards.[5]

• *International Lending Agencies*

International lending agencies are aware of the increase of awareness in environmental issues and the increased involvement of interested and affected parties in projects funded by such agencies. Already, international development aid is being influenced by environmental - and, especially climate change - issues which have a high profile on the agenda of the multilateral organisations.[6] As an indication of the importance which the World Bank accords to environmental issues, it has held an Annual Conference every year in the past five years "Environmentally and Socially Sustainable Development."

The 1997 World Bank Annual Report states that the Bank has an extensive commitment to environmental sustainability with a portfolio that includes investment programmes to reduce pollution, protect ecosystems and build capacity for environmental management. The Bank also requires that all Bank-financed programmes practice environmental sustainability. To this end the Bank has implemented, and is increasingly uses, the environmental assessment process.

• *Public Awareness And Activism*

The growth in environmental consciousness has been reflected in the increase in public scrutiny of activities which degrade the environment. A survey conducted recently by the international accounting firm, KPMG, in conjunction with South Africa's Industrial Environmental Forum, across a broad section of industries showed that the majority of South Africa's top 150 companies now regard the environment as a strategic issue and agree that the significance of environmental issues will increase over the next five years. Pub-

[3] The Earth Times/Business 1997

[4] Business Day 23 October 1997

[5] Financial Times UK 17 September 1997

[6] The Bottom Line: Industry and the Environment in South Africa, Bethlehem and Goldblatt, 1997 UCT press, p75

lic opinion and customer demands were rated by two thirds of the companies as significant pressures for greater environmental responsibility within their organisation and within industry generally.[7]

A recent example of the strength of public activism was the boycotting of Shell products, predominantly and most successfully in a number of European countries, as a result of the company's alleged environmental and human rights infringements in Nigeria. Public reaction at this level not only affects potential investors and shareholders but could also influences suppliers who do not wish to be associated with, or be seen as indirectly supporting, a company with a poor environmental record. Investors and suppliers will increasingly choose to invest in, and deal with, companies which have sound environmental management systems in place, and which display environmental integrity.

The pulp and paper industry in South Africa has come under public scrutiny in recent years as a result of the use of chlorine to bleach paper. There is doubt that the release of chlorine into the environment in large quantities has a detrimental effect on the environment and the market has concluded that chlorine is harmful to the environment, and this cannot be ignored. This is also an interesting example of the way in which companies can use environmental performance as a source of competitive advantage and perhaps as a source of protection since much of the pressure comes from companies which have completely eliminated chlorine from their production processes.[8]

The increase in public awareness and activism has a significant effect on the development of environmental law as it places pressure on governments to draft the appropriate regulatory legislation. This results in a command and control approach to solving environmental problems.

Industries can pre-empt such a situation by actively addressing environmental issues and presenting a clean, green image which incorporates transparency and disclosure. A successful self-regulatory system with broad participation, obviates the need for governments to introduce legislation with compulsory environmental reporting and auditing conditions.

In South Africa, the most significant trend in this regard has been the voluntary disclosure by Sasol and Eksom of environmental information in their annual reports. The benefits of doing so include the opportunity to demonstrate a company's green credentials to customers, employees, local communities and the government. This assists in building a positive corporate image.

- *The Rise Of Environmental N.G.O's*

The emergence of powerful, well organised, international, environmental non-governmental organisations (NGOs), such as Greenpeace and Friends of the Earth, is the most obvious manifestation of the rise of green consciousness. These NGOs enjoy wide public support and exert increasing influence on international policies and agreements as well as monitoring and exposing environmentally harmful practices. This trend is also reflected at the national level.

At the international level the humiliating failure of Shell's attempt to dispose of it's Brent Spar storage buoy in the Atlantic deep two years ago is a powerful reminder of the strength of NGOs. Despite initial approval from all the relevant governments, the Greenpeace campaign caused such a public outcry that a number of governments switched their support to the protesters, after which Shell's defeat became inevitable. Oil companies are now engaged in more effective dialogue with environmental groups, and have admitted that many of the industry's efforts to become more sensitive to the environment reflect pressure from green NGOs. John Browne, the chief executive of BP, reflecting the changing attitude of business to environmental issues, recently made the following statement:

> **"We must focus on what should be done, not because we can be certain climate change is happening, but because the possibility cannot be ignored. If we are all to take responsibility for the future of our planet, then it falls to us to take precautionary action now."[9]**

This amounts to a very sound and practical expression of one of the fundamental principles of international environmental law, the precautionary principle, and the statement is often

[7] Earth Times News Service 1997

[8] The Bottom Line: Industry and the Environment in South Africa, Bethlehem and Goldblatt, 1997 UCT press, p83

[9] Financial Times UK 23 August 1997

quoted with approval in green circles. The precautionary principle means that if the environmental impact of a development or activity is not known or is unclear then such a development or activity should not be undertaken.

NGOs have also been greatly strengthened through firstly, the world wide trend in legislation which provides increased access to environmental information by the public. This information was previously exclusively controlled by the "polluters" or the regulators. Secondly, the easing of rules relating to public access to courts in environmental matters.

In South Africa the right of access to information is entrenched in our Constitution[10] and access to court to protect the rights guaranteed in the Constitution is given to anyone.[11] The implementation and application of these rights is already having an impact on the enforcement of environmental regulations.

NGOs have also played a role in applying pressure, both nationally and internationally on governments to enter into international treaties and conventions and to promulgate and implement national environmental legislation.

In South Africa, for instance, NGOs are playing a leading role in the current development of a new National Environmental Policy which is currently being drafted in terms of South Africa's Environment Conservation Act.

- ***A Summary of the Effects of These Trends on Legal Systems***

The above international trends have had a dramatic impact on legal systems worldwide. The following is a summary of the changes resulting from such trends:

- *The expansion and broadening of the scope of environmental law*

Unlike many other branches of the law, it has become increasingly obvious that it is not possible to define environmental law strictly by reference to it's subject matter. In fact environmental law touches on practically every area of law, and environmental law and policy should therefore not be seen in isolation. This means that any activities of a company which have the potential to affect the environment may be regulated by some aspect of environmental law.

Rapid increase in environmental regulation

One of the most noticeable trends internationally is the increase in regulatory law in respect of the environment. For example, in the last 20 years, the European Community has enacted four action programmes on the environment and more than 200 pieces of legislation. At an international level there has also been a marked increase in the number of treaties and conventions relating to the environment.

In South Africa there are currently numerous Discussion Documents, Policies, Green Papers, White Papers and Bills all dealing with environmental issues. Regulations dealing with the submission of Environmental Impact Assessments prior to the undertaking of certain identified activities were published on 5 September 1997. The impact of these regulations is already being felt by industry in South Africa.

- *Standards becoming increasingly stringent*

As public concern about environmental degradation has increased and environmental law has developed, environmental standards have shown a marked tendency to become more stringent. A lack of scientific evidence concerning the exact effects of pollutants on the environment often makes it difficult to determine appropriate standards with any degree of conformity. While this originally operated in favour of industrialists and developers, the rise of public concern and the application of the precautionary principle has meant the raising of standards. There has also been a trend towards "dynamic" standards which tighten as pollution abatement technologies and techniques improve.

- *Shift from Curative to Preventative Measures*

The introduction to the European Community's Third Action Programme on the Environment (1982 to 1986) explained that although initially the essential aim of the European Community environmental policy was the control of pollution and of nuisances, the policy now emphasises and promotes the prevention of pollution.

The new approach is characterised by a desire to address the causes rather than the symptoms of environmental degradation and may generally be characterised as favouring anticipatory and proactive measures by industry rather

[10] Section 32

[11] Section 38

than reactive strategies aimed at mitigating or remedying environmental harm.

3. IMPLICATIONS OF THESE TRENDS FOR INDUSTRY

The trends discussed above have had an impact on the development of environmental law and, additionally, have implications for industry, as discussed below.

- *Feasibility studies for new developments and for the expansion of operations will be essential*

A close consideration of the long-term implications of international and local trends in environmental law and policy is crucial in developing on appropriate project design.

In essence, the safest method of minimising the potential for long term environmental liability is to base project design on the principle of managing on site as many of the adverse environmental effects caused by the particular process as possible while minimise the use of resources. Environmental Impact Assessments (EIAs) are usually conducted to assess the impacts of new developments, and should incorporate public consultation and take socio-cultural impacts into account.

Environmental impact assessments are designed to ensure that the environmental consequences of developments are understood and adequately considered in the planning process. Most countries now require EIAs prior to developments with potentially harmful environmental consequences. This, coupled with the implementation of the precautionary principle, should reduce developments which are detrimental to the environment.

- *Financing of new developments*

The imposition of environmental requirements, particularly EIAs, in international loan agreements is now well established and it is difficult to obtain financing and investment guarantees for new ventures without employing the cleanest available product technology. All the multi-lateral development banks, including the African Development Bank and the World Bank, have committed themselves to implementing procedures for the systematic evaluation of all development activities, including policies, programmes and projects under consideration for financing, to ensure that appropriate environmental protection measures are included.

The risk of inheriting liabilities

Depending on the laws and legal system of a particular country, companies may inherit environmental liability on the acquisition of land which is later found to be contaminated in some way.

An indication of the effects of this trend on industry can be obtained from an examination of the American experience. Purchasers of industrial land, or businesses which include property, in the U.S.A. must conduct exhaustive tests prior to purchase to avoid inheriting potentially crippling environmental liabilities. The most significant risks are:

- interruptive - whereby a company can be required to shut down until the environment hazard has been addressed.

- punitive- whereby companies can incur massive fines, often having to pay a specific amount per day. Imprisonment, though less frequent, is another punitive option.

- corrective - corrective orders require the owner and/or operator of an industrial site to take immediate physical action to reduce the environmental impact of the contamination. Corrective orders may result in a great deal of financial expenditure and a great deal of effort in engineering and construction.

While this scenario might not currently exist in any African state, it must be viewed as a trend which is developing and may have a impact on industry in Africa in the near future.

With regard to overseas investors and multinationals wishing to establish subsidiaries in Africa and particularly South Africa the decision in the Thor Chemical's case, the facts of which are discussed in detail below, will have important consequences. While the matter was eventually settled out of court, the case is seen as a major stepping stone to ensuring that British companies operating in South Africa and other developing countries are forced to apply the same strict health and safety standards which apply in their home country to subsidiary operations in the developing world.

If the effects of these two trends are combined, it becomes clear that multi-nationals wish-

ing to purchase land, businesses, companies or to do business through subsidiary companies in Africa may in the future be required to conduct exhaustive searches, prior to purchase, in order to avoid liability. Thus, industrialists in Africa will have to ensure that their operations are clean and the land uncontaminated if they wish to attract overseas purchasers and investors.

- *Investment in state-of-the-art technology*

One clear implication from various international trends is that investment in state-of-the-art technology (which frequently comprises both economic, environmental and technical efficiency), is required. The installation of energy efficient, clean technologies is invariably cheaper than paying for the retrofitting of "end-of-pipe" pollution abatement equipment when environmental standards are tightened. Furthermore, a company at the cutting edge of environmental standards effectively sets the standards which its competitors will be required to meet, usually at a greater cost to such competitor. At present in South Africa the BATNEEC (best available technology not entailing excessive cost) approach is applied. Consideration is give to what technology is available and what costs need to be incurred to implement such technology. Such an approach may be effective in achieving compliance with local legislation and standards but will not assist a company competing in international markets and trying to match up to standards set by industry in developed countries.

- *Increased costs of construction and operation*

Construction costs are likely to increase as a result of more stringent environmental laws. Such costs include the costs of environmental impact assessments and of the implementation of improved technology and waste treatment processes. However, there are positive aspects to this.

First, increased capital expenditure on measures designed to prevent or mitigate environmental harm is likely to result in significant long term savings by reducing the need to retrofit pollution abatement equipment and by reducing the risk of future environmental liability.

Second, expenditure on environmentally sound technology and design can often be offset to a significant extent by positive gains such as savings on treating process residues to produce marketable products and a reduction in the use of costly inputs of natural resources.

Third, it may be possible to phase in capital expenditure to take advantage of the development of new technologies.

Fourth, subsidies or fiscal benefits may become available for capital expenditure which is beneficial to the environment. In South Africa, for instance, the Industrial Development Corporation (IDC) has recently introduced a "Cleaner Production" scheme under which it will finance the introduction, or upgrading, of ecologically safe plant and equipment. The scheme marks a break from the IDC's tradition of granting finance for increased production and has been introduced as a result of mounting pressures on South Africa to conform to internationally accepted standards, including those related to the environment.

As with construction costs, operating costs will also increase due to more stringent environmental laws and the application of the polluter pays principle. Once again these increased costs may, to some extent, be mitigated by fiscal incentives such as tax savings for increased energy efficiency or waste reduction.

- *Industries will need to focus on their relationship with third parties*

1. Government Regulators

   Increased international and local pressure from a number of sectors including the general public and NGOs will require government to enforce and implement available environmental regulatory law. Government authorities are likely to intensify monitoring and control over polluting companies. Companies will need to implement systems whereby they are able to assess and monitor the impacts of their operations and processes on the environment and manage the risk arising from such impacts, in order to be in compliance with the applicable regulatory law.

2. Stakeholders and Potential Investors

   In industrialised countries, environmental performance is increasingly being seen as an indication of the general performance of an enterprise and is therefore a matter of interest to many potential investors and stakeholders. The risks involved in investing in a company with a sound environmental policy and management system are less than in investing in company with a history of

environmental transgressions. In fact there are a growing number of investment funds which cite environmental performance as a key criterion for investment, and actively monitor environmental performances of companies, including subsidiaries of multinational corporations. At present such funds are primarily based in developed countries. The financial consequences to a company of acquiring a reputation as a polluter are potentially severe.

Companies can also expect increasing pressure from shareholders to be given information about the environmental performance of the company in its annual report. While the disclosure of environmental expenditure in annual accounts is not a legal requirement in most jurisdictions, the United Nations Inter-governmental Working Group of Experts on International Standards of Accounting and Reporting have made a proposal to that effect, which is in keeping with the world-wide trend towards disclosure.

3. The Public

Internationally, industry is viewed by the public as the major polluter of the environment and claims by industry that it is operating responsibly are therefore viewed with a degree of scepticism. It is likely that the public will expect more and more companies to make public commitments to environmental policy statements and to demonstrate their commitment to achieving environmental compliance and, ultimately, excellence.

Greater public access to environmental information and to the courts will mean that a great deal more attention will have to be given to the content of public communications on environmental issues. This is also crucial in relation to environmental disasters which are likely to result in prosecutions or civil litigation. Companies would be well advised to prepare a strategy for such emergency situations.

4. Environmentalists

Many industries tend to regard some environmental groups as adversaries and to adopt a defensive attitude towards such groups. However, given the fact that many environmental groups enjoy widespread public credibility and support, and are increasingly demonstrating an ability to influence public opinion, an antagonistic attitude can do great damage to a company's public image. Such an attitude can also severely impede a company's activities, particularly where public consultation is a prerequisite to obtaining the necessary consent to undertake a particular development or activity.

- *Potential personal liability of management and staff*

In certain Western countries such as the United Kingdom, USA and Canada, in the appropriate circumstances, the law provides for imprisonment of the directors and managers of polluting companies. In February 1996, a British court sentenced an offender to 18 months' imprisonment for illegally depositing dangerous chemical waste in circumstances which put the public to grave risk of injury.[12]

Targeting directors and managers is a developing trend, especially common in those jurisdictions where governments are responding to the need for effective environmental regulation and enforcement.

Many jurisdictions provide for so called "due diligence defences" which basically allows individuals to escape personal liability for environmental offenses where they can establish that they acted with the appropriate degree of care. The implications of this are that sound environmental management systems should be established and compliance with such systems should be monitored at a senior level within the company as a matter of good business practice to provide a factual basis for raising a defence of due diligence.

- *Environmental Audits*

The International Chamber of Commerce (ICC) defines an environmental audit as "a management tool comprising a systematic, documented, periodic and objective evaluation of how well environmental organisation, management and equipment are performing."

[12] The Personal Liability of Directors in the United Kingdom for Environmental Offenses, Penny Jewkes, Environmental Liability, 1996 volume 4 issue 5

Regular auditing of a company's performance whether it be simply to monitor compliance with existing legislation, to monitor the attainment of a company's environmental goals or prior to acquiring a new company, or site, is a fundamental component of responding to the challenge posed by the growth in environmental awareness. Indeed, it will be increasingly difficult for companies to comply with their environmental law obligations without auditing procedures since regular monitoring is likely to be an increasingly common condition in permits. Additionally, the implementation of a cradle to grave approach to production will require comprehensive information gathering from all sectors of the organisation. The cradle to grave approach requires the manufacturer to take responsibility for the product from stage of the weaning of raw materials through the manufacturing process to the final disposal of the product.

• *Research and Development*

Research and development of environmentally sound techniques is becoming increasingly important for industry for the following reasons:

- it is useful in complying with legal standards such as BATNEEC (best available technology not entailing excessive cost).
- it can enable companies turn the threat of higher compliance costs into an opportunity to participate in a lucrative new international market.
- state-of-the-art technology is increasingly important to remain competitive internationally and to participate in international markets.
- internationally, industry is going through a period of technological change with the emphasis being placed on innovation to improve simultaneously the economic and environmental performance of various processes.
- the development of innovative, site specific technical solutions adapted to local conditions is vital to avoiding potentially debilitating long-term dependence on expensive foreign technologies.

• *The need for a reliable information base*

In addition to providing for a continuous and comprehensive flow of internal information about the company's environmental performance, it will be necessary to establish systems for continuously monitoring the following:

- rapidly changing laws and standards - this is vital as industry will have to make a greater effort to stay abreast of changing legislation. Additionally, environmental policies based solely on compliance with legislation are likely to prove inadequate as legal standards will probably tighten more quickly than technological changes can be implemented by industries.
- international and national trends - to keep abreast of the best practices and technologies available world-wide.

As far as general environmental law and policy are concerned, the European Union and the USA are likely to be the most influential sources, while reference may also be made to Canadian and Australian legislation. The European Union's environmental policy has been developing rapidly over a number of years and provides a useful model because it is sensitive to questions of implementation under the different legal regimes of the various member countries and because of the volume of trade between African states and the Europe Union.

It will also be necessary for companies to ensure that they periodically obtain independent advice and input regarding changing laws and trends to ensure that the company remains responsive to international trends and standards, and to public expectations.

• *Potential trade barriers*

Despite the fact that most forms of trade barriers implemented to encourage environmental protection would be contrary to the policy of World Trade Organisations (W.T.O), there is growing public support for such measures. The Dolphin/Tuna case referred to earlier is one example of this trend.

A more recent case with similar facts is currently being examined by a W.T.O dispute panel. In this case four Asian shrimp exporters - India, Malaysia, Pakistan and Thailand - have complained that a US ban on imports of shrimp caught by using nets without turtle exclusion devices breaches international trade rules by imposing US law on other countries. Although the final report is only due in December, Thailand has already changed it's fishing technique in or-

der to comply with the US requirements and is apparently only pursuing the case on a matter of principle. Thailand realises that such disputes can drag on for years and that, ultimately, the trade Panel's decision may be of little consequence. In the long term it makes economic sense to adapt and quickly regain one's position as a competitive trading partner. Thus, irrespective of the W.T.O Panel's decision the US ban has already had the desired effect on one of its trading partners.

- *Competitiveness in local and international markets.*

In light of the fact that retrofitting and remedial action tends to be more expensive than the initial installation of clean technologies and taking preventative measures, progressive company policies will be essential to avoid potentially crippling future compliance costs, which will also reduce competitiveness.

A poor environmental record is likely seriously to undermine a company's reputation and international competitiveness. In the case of South Africa there have already been instances where companies have received international criticism and had business deals cancelled because their policies or practices were felt to be inadequate.

Examples such as the effect of the Exxon Valdez disaster on Exxon itself show how even the most powerful companies can be seriously affected. The public outcry led to holders of Exxon's credit cards cutting them up at public rallies, and consumer resistance probably contributed to a US$ 600 million drop in earnings in the first trading year after the disaster. This loss does not take into account the US$ 1 billion in clean-up costs paid by Exxon.

- *Implementation of an environmental management system*

It will be apparent from the above consideration of international trends that the implementation of a comprehensive environmental management system is essential in order to deal adequately with the legal requirements and public expectations arising from the increasing concern with industry's environmental impact. A functioning system which will ensure effective compliance and minimise the possibility of future liability for harm caused to the environment is likely to include the following elements:

- the backing of senior management;
- clear lines of accountability and reporting structures throughout the company;
- clear guidelines and objectives with auditing mechanisms to monitor their attainment;
- a total quality management approach to environmental matters which aims to look consistently for ways of improving performance such as waste reduction, energy efficiency and zero effluent.

In formulating and implementing an environmental management system, it is helpful to refer to standards such as ISO 14000. These do not lay down specific criteria for environmental performance but rather establish principles to be followed by an organisation which wishes to work towards compliance with its environmental policy and to demonstrate such compliance to others.

It is anticipated that once the programme to establish accredited independent auditors to certify compliance with such standards is complete, this method will become an important means of raising investors, the public and stakeholder's perceptions of a company.

- *General overview of the impact of international environmental pressures on the South African industrial sector.*

Recently, a study of 12 sectors of industry in South Africa was conducted in order to determine the effect of international environmental pressures.

"The experience in most sectors is that environmental pressures are building up in export markets but that, as yet, there are no experiences of actual trade restrictions or barriers to foreign markets arising from these pressures." Some countries are however affected by other countries' environmental regulations, and by international environmental agreements. There are examples of a number of sectors which have had to adapt to meet the environmental requirements of the market and this is especially the case in the pulp and paper, packaging, fruit and, to a lesser extent, chemical sectors.[13]

[13] The Bottom Line: Industry and the Environment in South Africa, L Bethlehem and M Goldblatt 1997 UCT Press, p90

In some sectors, such as the coal, timber and pulp industries, companies have found that they have a competitive advantage as a result of international environmental concerns. The advantage is based more on natural endowments than on a conscious environmental policy but this does give a further indication of the importance of environmental concerns.

This study was based on a small but significant sample of exporters and the experience of the companies shows that they are increasingly having to demonstrate that use of such products will not affect detrimentally the environment in the import country or contravene environmental standards set in such countries.

The biggest change in the South African legal context arising from the global environmental trends has been the inclusion of an environmental right in the South African Constitution. All persons acting in their own interests or even in the public interest may apply to the courts to have this right protected.

4. CASE STUDIES ILLUSTRATING HOW CHANGING TRENDS HAVE AFFECTED INDUSTRY

The following case studies are intended to illustrate just a few of the numerous ways in which industries are affected by environmental laws and trends. All three are set in the South African context and all illustrate the positive aspects of compliance with environmental laws, both domestic and international, and the extent to which lack of compliance can be detrimental to a company.

1. The first case study is an illustration of the extent to which international or foreign regulations and standards affect industries in other countries.

A local vehicle manufacturer was prompted by its European parent company to recognise the strategic advantages in obtaining ISO 14001 certification for its business. The parent company had a number of reasons for encouraging ISO 14001 certification. Firstly, concern for the environment is shared by more and more stakeholders in all industries including the company's employees, customers, shareholders and the wider community. As a result, a good environmental image can be a competitive advantage and the association of the company's name with the ISO 14001 standard can contribute to developing a brand image. Secondly, as a result of the growth in public awareness and concern over environmental issues, multinational corporations can no longer afford to demonstrate lower environmental standards in subsidiaries situated in underdeveloped countries. Finally, where environmental aspects of their operations are given due priority, industries can avoid the sometimes costly consequences of legal infringements and remedial actions.

A current environmental status assessment was conducted and the results of sampling performed during the survey were evaluated against European standards.

The aim of the assessment and subsequent implementation of ISO 14001 principles was to ensure that the local manufacturer conformed to the same environmental standards as those required of the parent company.

The local manufacturer engages various suppliers who supply products which may harm the environment. The product's production processes and the contractors who undertake a variety of activities on the vehicle manufacturers site, may also be causing environmental damage. Accordingly, and in order to demonstrate due diligence, the following recommendations were made to the manufacturer:

- all contracts with external contractors must specify relevant work procedures to ensure environmental measures are followed;
- contractors and sub-contractors must sign acceptance of these conditions to signify compliance with the manufacturers environmental requirements;
- only approved contractors and suppliers are to be appointed, and the contractors and suppliers' environmental performance must be regularly monitored by the manufacturer to ensure compliance.

Basically, the contractors and suppliers will be required to conform to the same environmental standards as the local manufacturer, who has to comply with European standards.

From this case study one can see not only the extent to which subsidiaries of multi-nationals are affected by foreign laws but also follow the chain reaction which results with industries which are not necessarily exposed to export markets being affected by European standards and regulations.

While it may be costly for these contractors and suppliers to make the requisite changes in order to conform with the standards set by the manufacturer, there are incentives for them to do so. Firstly, they will be placing themselves in a more secure position as contractors and suppliers in that they will have moved a step ahead of any competitors and secondly, by being forced, as it were, to comply with European standards, they might well be able to enter export markets previously closed to them.

2. The second case study demonstrates how detrimental negative publicity can be for a company and it also serves as an important indicator of the trend towards requiring multinationals to apply the same health, safety and environmental standards to their subsidiary companies as those required of the parent company.

Thor Chemicals is a British-based multinational which is involved in the manufacture and processing of chemicals. It has a number of wholly owned subsidiaries. The South African division of Thor Chemicals was established in 1963. In the late 1970's environmental health problems were discovered at one of their British plants and, in 1987, Thor discontinued its mercury operations in the UK as a result of threats of court action. However, the South African mercury processing operations continued and the health and safety problems that had earlier been identified in England were replicated in the South African operation.

During the late 80's, water quality problems downstream of Thor's plant were noticed, with mercury levels being 1000 times higher than the World Health Organisation's drinking water standard. The company appeared before the International Water Tribunal which, due to the refusal of the South African government to release important information, could unfortunately do no more than recommend that an independent environmental assessment be carried out.

During 1992 three workers form the plant were admitted to hospital and two lapsed into a coma. This prompted a formal enquiry by the Department of Manpower and criminal charges were subsequently formulated against Thor. In 1993 Thor Chemicals and three of it's top management officials were charged with culpable homicide. Ultimately, and largely due to an inept prosecution, the equivalent of a plea bargain deal was struck whereby the charges of culpable homicide were dropped and the Company paid a negligible fine.

This was, however, not the end of the matter and civil proceedings were brought in England against the English-based Thor Companies and their chairperson. It was argued that since Thor is British-owned and since there is an apparent continuity between the problems experienced at the UK plant and the one in South Africa, the parent company owed a duty of care and was liable for damage and loss suffered by Thor employees at the South African plant. The House of Lords, the highest court of appeal in England, refused to entertain an appeal by Thor for the litigation to be heard in South Africa where the health and safety legislation was less advanced than in Britain and in April this year Thor Holdings agreed to a settlement of R9 million to be paid to the families of the three workers.[14]

There are two very important lessons which can be learnt from this case. First, the case received a great deal of negative publicity in South Africa, the UK and many other countries and the company was forced to close down it's mercury recycling plant. More important even than the R9 million paid by Thor Holdings the company stood to lose much through bad publicity. Suppliers, shareholders, customers, in fact all stakeholders, do not want to be associated with a company which has a poor environmental record.

Secondly the case demonstrates what may very well become an international trend whereby foreign companies operating in developing countries will be forced to apply the same standards which apply in their home country to the country in which they are registered.

3. The final case demonstrates the impact of constitutional transformation on environmental law and litigation and it also highlights the value of common law remedies in environmental conservation and litigation. It demonstrates the extent to which new laws, in this case a constitutional right, are requiring industries to either adopt cleaner technology or face being closed down.

The facts of this case are as follows. A company established a saw-milling plant in South Africa which produced saw-dust and wood-chips in large quantities as a by-product. These by-products exceeded market demand and accordingly had to be burnt. The wood burning process pro-

[14] The Bottom Line: Industry and the Environment in South Africa's Bethlehem and Goldblatt, 1997, UCT press 1994

duced noxious and offensive gasses and was therefore defined as a scheduled process for which a registration certificate is required in terms of South Africa's Atmospheric Pollution Prevention Act. The type of burner which the company was using was not effective and during this time the Department of Health and Welfare issued a directive that these burners should be phased out over a three-year period. The company had a temporary permit which allowed it to use the old burner which it undertook to phase out over the stipulated 3 year period.

The Department of Health and Welfare received several complaints from the occupiers of premises in the surrounding areas regarding the emission of smoke from the burner and eventually the company was served with an application for an interdict by the Department to prevent it form continuing to use the burner.

The company opposed the application on the basis that certain criminal sanctions were provided for in the applicable Act which regulated the emission of noxious and offensive gases and the remedies in this situation were limited to such sanctions. The court, however, granted the interdict and ordered the company to stop using the burner.

The company further argued that the Department could only impose only criminal sanctions and could not apply for an interdict as this remedy was not available to the Department in terms of the Act. The company also argued that the department had no direct interest in the matter and therefore did not have *locus standi* to bring the application.

The court based it's decision to a large extent on two provisions of South Africa's then interim Constitution. Firstly, section 29 which protects the right to an environment which is not detrimental to one's health or well-being and, secondly, the provision allowing anyone acting in the public interest to approach the courts to protect the rights contained in the Bill of Rights. The court held that there was a duty imposed on the Department to implement and enforce the Act. The Department was entitled to bring the application since it was acting in the interests of the occupiers of premises surrounding the saw-mill in protecting such occupiers right to an environment that was not detrimental to their health or well-being, which right was protected in terms of the interim Constitution.

This case study illustrates that interested and affected parties, in South Africa, can if a company is acting in contravention of environment legislation (be it an Act, a regulation or even a by-law), bring an interdict application to court for an order forcing the particular company to cease its unlawful activities. If one considers that there are hundreds of company's that could not operate without contravening numerous provisions of South African environmental law and would therefore have to close down if ordered to comply, the risk to such a company is far greater than a fine or the personal liability of managers or director as is provided for in most legislation.

5. HOW CAN INDUSTRIES SUCCESSFULLY MANAGE ENVIRONMENTAL LEGAL RISKS?

An environmental management system is the most effective means of managing environmental risks. However, there are other management tools which are used both to implement an environmental management system and to identify environmental legal risks and reduce such risks on a short-term basis.

- *Environmental Management Systems (EMS)*

An EMS is a means of integrating the environmental concerns facing a company into its decision making process at both strategic and operational levels. It is aimed at achieving continuous improvement in corporate environmental performance, measured against clearly defined goals and objectives. It requires the company to define a specific environmental policy, conforming to acceptable standards and based on the company's strategic needs, market pressures and specific environmental impacts. It further requires the company to provide the organisational structures and resources necessary to implement the EMS. Periodic review at executive level looks at the results of environmental audits which may be conducted either externally or internally.

In addition, adhering to an international standard such as ISO 14001 could minimise the effects of international trade barriers, ensuring that corporate efforts to trade globally or even to source technology globally could be improved.

Environmental management systems seek to integrate environmental responsibility into

every day management practice. t may be defined as "the organisational structure, responsibilities, practices, procedures, processes and resources for implementing and maintaining environmental management."

EMS standards are the requirements which those seeking certification must achieve. They have been developed in a number of countries including the UK, France, Ireland, Spain and South Africa. In addition to these national standards, two international management systems and standards have developed, namely the Eco Management and Audit Scheme (EMAS) in the European Union and the ISO 14001 world wide standard, developed by the International Standards Organisation.

ISO 14001 is applicable to any organisation world wide. It focuses on internal management processes and does not require public disclosure of environmental information. The European Union's EMAS is applicable to industrial companies in the European Union and focuses on providing environmental performance data for stakeholders on a site by site basis.

As a result of the increase in national and regional environmental standards in recent years, the International Standards Organisation (ISO) established a Strategic Advisory Group on the Environment (SAGE) to assess the need for future international environmental standards. As a result the ISO technical committee was established to compile standards to assure a more uniform approach to environmental management world-wide (the ISO 14000 range).

The guiding principles in respect of these standards are, *inter alia*:

- that they should result in an improvement of environmental management;
- that they minimise trade barriers;
- that they be applicable to all nations, leading to harmonisation of environmental standards;
- that the standards be suitable for internal or external verification;
- that they should simplify and reduce registration and labelling requirements;
- that they provide guidance for the evaluation and comparison of performance;

that they be designed and implemented in a voluntary manner.

Participation in ISO 14001 is open to any organisation that wishes to:

- implement and maintain an environmental management system;
- assure itself of compliance with its stated environmental policy;
- demonstrate compliance with other organisations' environmental requirements;
- seek certification of its environmental management system by external organisations.

ISO 14001 specifies the requirements of an environmental management system and was written to be applicable to all types and sizes of organisations and to accommodate diverse geographical, cultural and social conditions.

An organisation has freedom and flexibility under ISO 14001 to define the boundaries of the system, and may choose to implement the standard for the entire organisation, or to limit it to specific operating units or activities of the organisation.

Not only does the implementation of an EMS enable a company to manage its environmental risks, but demonstration of successful implementation of ISO 14001 can be used by an organisation to assure interested and affected parties that an appropriate EMS is in place.

- *Environmental Risk Assessments*

Environmental Risk Assessment allows a company to identify and quantify its environmental risks including legal risks and can thereafter be used to prioritise remedial actions and the allocation of resources in addressing environmental problems.

- *Environment Impact Assessments (EIA's)*

This assessment is usually conducted at the inception of a new project to identify the nature and degree of potential environmental impacts. EIA's include descriptions of feasible alternatives to the proposed development or activity, comments from interested and affected parties, an assessment of the impacts of the development and mitigatory measures which may be implemented to reduce such impacts.

• *Enviro-legal Compliance Registers*

Such compliance registers set out the compliance requirements for a particular industry. Such requirements may include legislation in the form of Acts, regulations, and by-laws and may include industry standards, permit conditions and internal standards set by the particular company. Compliance registers assist a company in assessing such compliance requirements and assist in the planning and implementing of procedures and systems to achieve compliance, thereby greatly reducing a company's enviro-legal risk.

• *Cleaner Production (CP) Assessments*

These assessments are used to identify sources of environmental concern and then to mobilise efforts to address these sources.

"A central element of a CP assessment is analysis of material and energy flows entering and leaving a process. Cleaner production options, e.g. substitution of raw materials, or use of more energy efficient equipment, can be identified after quantifying inputs and outputs from a process."[15]

• *Life Cycle Assessments*

ISO 14040, 14041, 14042 and 14043 deal with life cycle analysis. Life cycle assessments are used to consider the environmental issues associated with the production, use, disposal and recycling of products, including the materials from which they are made.

• *Monitoring*

Monitoring indicates where action is necessary and assists with the evaluation of environmental performance. All aspects of a company's environmental performance should be monitored. This should not be limited only to the discharge of effluent or emissions but should also be used for the monitoring of external factors such as policy development, international trends and the concerns of interested and affected parties.

• *Communication And Reporting*

The monitoring of all environmental aspects of a company would be useless without adequate communication and reporting structures in order that employees and relevant outside parties can see the effort placed on environmental performance. Efficient communication and reporting structures will also be an essential element in demonstrating due diligence from directors and managers point of view in order to avoid potential personal liability. Furthermore, these structures will facilitate the solving of problems and will help to raise awareness.

• *Environmental Auditing*

ISO 14000 also has an auditing component - ISO 14010, 14011/1 and 14012. These standards form part of the fifth phase of an environmental management system and aim to promote continual improvement within a company by means of a systematic and objective evaluation of environmental performance.

• *Training, Awareness and Development*

Employees need to be made aware of environmental impacts and need to be provided with the resources and capabilities needed to achieve identified environmental objectives.

• *Contractual*

Companies can attempt to manage their environmental risks by requiring that suppliers and contractors, including contractors responsible for removing and treating or disposing of waste, indemnify the company against liability incurred, or loss suffered, by the company as a result of the activities of such suppliers or contractors in contravention of environmental regulatory law, or unlawful activities which may lead to common law interdict proceedings or actions for damages.

6. CONCLUSION

It is clear that in the light of recent international trends, the increase in the amount of environmental law, the tightening of international standards, and the general increase in pressure on industries to demonstrate a pro-active approach to environmental issues, no industry can afford to ignore its impact on the environment and the associated legal and economic risks of such impacts. Industry must be proactive and start to implement systems and procedures to manage this risk and thereby gain a competitive edge through improved environmental performance.

Industry must recognise that it has a role to play in the decision as to whether it conducts its

[15] Steel Industry and the Environment-Technical and Management Issues

operations under a command and control type of regulatory system, or a system incorporating incentive-based mechanisms. Voluntary reporting, incorporating transparency and disclosure, will go a long way towards achieving a system of co-operation and mutual benefit between the makers and the enforcers of environmental law and those who must comply with such law.

ENVIRONMENTAL IMPACT ASSESSMENT AS A TOOL FOR INDUSTRIAL PLANNING

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1. INTRODUCTION

Principle 17 of the Rio Declaration adopted by the United National Conference on Environment and Development (UNCED) provides as follows:

> **"Envrionmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority"**

In addition to principle 17, the Conference also adopted other principles relevant to environmental impact assessment (EIA). Principle 4 requireS that environmental protection should constitute an integral part of the development process. Principle 10 provides that citizens should participate in environmental decision making. Principle 15 provides for the observance of the precautionary approach where there are threats of irreversible damage to the environment. The full range of the precautionary approach requires anticipation and prevention of environmental damage.

The Rio Declaration is a statement of principles of environmental management which are universally accepted and which states have already employed as safeguards against environmental mismanagement. Environmental impact assessment is certainly one of those principles which have received universal acceptance in national legislation and international legal instruments.

2. WHAT IS ENVIRONMENTAL IMPACT ASSESSMENT?

Environmental Impact Assessment (EIA) is understood to refer to:

(1) A study of the effects of a proposed project on the environment.

(2) The study constitutes a comparison of the various available alternatives in terms of technology, design, and site and an identification of which alternative represents the best combination of economic and environmental costs and benefits.

(3) The study predicts the possible environmental changes that the project could cause.

(4) The EIA is designed to enable the environmental effects of a project to be weighed on a common yard-stick with economic costs benefits[1].

EIA, therefore, is a tool for decision making which enables the decision maker to take environmental issues into account in the early stages of project conception and development. EIA does not necessarily eliminate altogether projects that have adverse impacts on the environment.

Its primary function is to avail to both the developer and the national authorities the opportunity to choose development projects with full knowledge of their impacts on the environment. This enables both the developer and the national authorities, where they choose to proceed with projects with potential adverse environmental impacts, to develop plans and policies for the mitigation of such impacts.

It is worth stressing that EIA is a study of possible impacts, and not just a study of poten-

[1] Y.J Ahmed and G.K Sammy - Guidelines to Environmental Impact Assessment in Developing Countries, Nairobi, UNEP, Regional Seas Reports and Studies No. 85, 1987.

tial negative impacts only. EIA attempts to predict all significant impacts, whether negative or positive. This is because it is only by considering both the negative and positive impacts that the true worth of a project may be determined. Further, impacts which are considered positive today may be considered negative tomorrow depending on the state of science or public perception.

2.1 Rationale for EIA

Current trends in environmental management are emphasise the need to enhance measures that lead to the prevention of degradation of the environment and promote the conservation of natural resources. The monitoring and control of ex-post facto pollution (pollution which has already occurred), while remaining an important issue in environmental management has, nevertheless, lost pride of place to preventive measures. The principal reason behind this change is the realisation that in environmental management preventing environmental degradation is more cost-effective than repairing environmental damage which has already occurred. EIA is now recognised as one of the most effective tools in this preventive approach, along with long term environmental planning and environmental auditing.

EIA makes it possible to predict through study and, therefore, with a degree of exactitude, the environmental effects of a project which can be foreseen within the limits of existing scientific and social knowledge. This prediction enables the choice of projects which are compatible with sustainable development.

Seen in this context EIA lies at the centre of sustainable development. It encourages the development of projects that are at home with their social and environmental surroundings but which, at the same time, are economically viable.

2.2. Relevance of EIA to industry

Since the industrial revolution, human society has faced a paradox. On the one hand, industry has brought tremendous benefit to humanity by increasing the pace at which the human being can obtain the basic essentials of life and also by increasing the stock of goods, thereby raising the basic standard of living. On the other hand, however, industrialization has brought about pollution as the necessary bi-product of manufacturing activity. Extensive pollution - solid, liquid or gaseous - necessitate regulation through legislation or the common law. On the whole, legislation has imposed strict standards for compliance and at the same time created civil liability to redress injuries suffered by individuals as a result of pollution.

New torts based on negligence have emerged including torts relating to control over dangerous forces (ie the rule in the case of Rylands vs Fletcher[2]) because of the kind of materials that individuals were likely to use in the quest for industrialization. Further, older torts, such as those relating nuisance and trespass, were expanded to cover the new situations.

Even in the field of commercial law, there has been a response to these developments. The law relating to sale of goods for example has developed implied conditions and warranties relating to product quality, thereby creating a basis for product liability. Insurance law has also taken into account the need to insure against liability arising from insurance damage.

The effect of increased environmental regulation of industry has been to increase the potential liability from polluting activities . To minimise its exposure to potenatial liability industry has had to develop mechanisms for predicting and avoiding or minimise the impacts of polluting activities. Where pollution has already occurred industry has had to bear the costs of repairing the environment damage, and for this reason has had to insuring against the risk by taking out appropriate insurance policies.

2.3 The polluter pays principle as a rationale for EIA.

In the run-up tpo the Rio Conference debate raged on whether industry should bear the cost of remedying the environmental damage arising from industrial activities or whether society at large should bear these costs because of the benefits industry brings to the society.

In countries where industry is mainly in private hands with profits going into private coffers, an argument that society in general should bear the cost of the polluting activities of industry is unsustainable. Since the private developer obtains the benefits of the industrial activity, it is logical that he should pay the costs of cleaning up or repairing the environmental damage.

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[2] (1866) LR 3HL 38

Nevertheless, in practice it has not been easy to make the polluter pay the actual compensation to society, hence the need to create mechanisms to avoid or, at any rate, minimise, pollution.

Looked at from another perspective, since the polluter may be required to pay either through penal or civil law it is in the interest of the potential polluter to assess the environmental risks involved in the activity he proposes to undertake and see whether there are measures he can take to avoid pollution all together. In this argument inheres the rationale for EIA as an environmental management tool for industry.

2.4 Legislative Basis for EIA

EIA should be based on an enabling legislative instrument at national level. Such an instrument should set out the threshold of activities which require an EIA. The instrument should also set out the principle procedures to be followed in conducting the EIA, including the procedures for review and for approval. This is the approach that is typically followed in national laws on EIA[3].

In some cases, multilateral organizations or bilateral donor agencies have established mandatory requirements for E.I.A 's to be conducted before funds can be made available to states for their use.[4]

2.5 Responsibility for EIA

Most legal systems make it the responsibility of developer to carry out an EIA study. This applies even to international financial organisations like the World Bank, which make carrying out the EIA the borrower's responsibility (see World Bank Operational Directive 4.01 of October 1991). The responsibility to carry out an EIA study includes paying for the assessment and ensuring that the study is conducted properly. In this regard industry, as the developer, must be prepared to bear costs of EIA. The duty of Government (except where it is a borrower from an international financial organisation) is restricted to reviewing the EIA report and determining whether the project should proceeed.

[3] The Uganda National Environment Statute 1995 sections 20-22, The Zambia Environmental protection and pollution control Act 1990 section 6(2) (i) and the regulations that have been made there under)

[4] World Bank operational directive 4.01 of October 1991

2.6 Timing of EIA

EIA should be done at the inception of the project as part of the project design. If possible, it should be conducted at the same time as the economic feasibility study so that the studies can complement each other. The feasibility study is undertaken by the developer to determine the economic viability of the project. It is not synonymous with an EIA and, unlike EIA, is rarely a mandatory legal requirement. But even where a feasibility study is not done, EIA needs to be undertaken during the stage of project design. To conduct an EIA later is to risk missing out on its full benefits as it would be difficult to alter a project whose design has already been determined.

3. LEVELS OF ASSESSMENT

EIA systems ordinarily have various levels assessment. In countries such as Uganda and Zambia three levels of assessment have been proposed as follows:

Level 1 : Automatic Exclusion:

EIA law normally provides for certain projects to be undertaken without the need for an EIA (e.g. small scale industries, known as the "jua kali" sector in East Africa). Excluded projects will not be listed in the list of categories of projects which require an EIA. The implication of not being listed is that the project may proceed without an EIA unless the national environmental authority decides that in a particular instance an EIA is required. Typically, medium to large scale industry will appear on the list of projects for which an EIA is required. In some cases, the law may provide threshold limits below which activities are not required to undergo an EIA.

The system of providing for lists creates an automatic system for screening projects for EIA.

Level 2: Preliminary Assessment:

EIA law normally provides that all projects which are listed in legislation as requiring EIA, or which pass the minimum thresholds set, undergo a preliminary assessment to determine whether a full EIA is required. In this case the developer gives a description of the project and states its possible impacts in a preliminary report. The report is submitted to the national environmental authority which has the mandate to either approve the project for implementation without a full EIA or require the developer to undertake full EIA

study. Many smal and medium sized projects are usually approved at the preliminary assessment stage, unless the preliminary report discloses that there may be significant environmental impacts which requires further investigation.

Level 3: The Environmental Impact Study (EIS)

Where the preliminary assessment shows that the project is likely to cause significant impacts on the environment then the environmental authority may require that an environmental impact study (EIS) be undertaken. Projects often differ in the magnitude of effects, significance of effects (a small project may have more adverse impacts on the environment than a large one depending, inter alia, on the in-puts, outputs and technology used or the location of the project) and the territorial extent of the effects. Therefore, the EIS must be project specific.

3.1 The Environmental Impact Statement

At the conclusion of the environmental impact study an environmental impact report (EIR) is made by the developer. This report should be comprehensive and informative for two reasons. First, it forms the basis for the decision by the environmental authority on whether or not to approve the project. Secondly, it may subsequently be used the national authority as the basis for post-assessment environmental audits.

3.2 Credibility and Reliability of the EIA Statement

To ensure that the study is conducted according to acceptable standards, national law usually employs a variety of mechanisms. In some countries the national authority is required to approve the names and qualifications of persons to undertake the study. These persons are required to sign the environmental impact statement before it is submitted. These measures are intended to discourage the production of sub-standard studies. To augment these measures, the developer may be required to disclose in the statement how the information contained in the report was gathered.

4. MAIN STAGES IN THE EIA PROCESS:

Stage 1: Preliminary actions:

1) The description of the project which is done as part of the preliminary assessment stage is submitted to the environmental authority.

2) The developer appoints a Co-ordinator for the environmental impact study. The qualifications of the Co-ordinator depend on the nature of the project.

3) Together with the Co-ordinator, the developer selects the experts who will will undertake the study. Preference should be given to experts with specific knowledge of local or similar conditions.

4) The Co-ordinator allocates work and and scoping is carried out.

5) The team reviews and determines the applicable laws, regulations and standards.

6) The developer, the Co-ordinator and the team identify the various alternatives for the development of the project (sites, technology and design).

Stage 2: Scoping (or identification of impacts):

1) The team, under the guidance of the Co-ordinator, identifies all the possible environmental impacts of the project.

2) The Co-ordinator, the team and the environmental authority determine the scope of the study based on the following criteria:

   a) magnitude, including the impact of the project on environmental resources.

   b) extent, including the geographical extent of the impact.

   c) significance, including actual effects of the impact on the environmental resource.

   d) special sensivitity, including impacts which are significant in the specific local economic, sociological and ecological setting.

3) In countries where this is required, the developer submits the names and qualifications of all persons to carry out the

study to the environmental authority for approval.

Stage 3: Baseline study:

The team undertakes a detailed description of the existing environment including the social and economical activities of the population resident in the potentially affected areas.

Stage 4: Impact evaluation:

The team evaluates the various impacts and ranks them in order of importance on the basis of two criteria:

1) quantitative change where change can be quantified.

2) qualitative change where change can not be quantified but instead the impact of the project depends on the environmental acceptability of the project.

Stage 5: Public participation in environmental impact study:

1) The team seeks the views of the community who are likely to be affected by the project.

2) The views of the public are taken into account in the development of mitigation measures.

Stage 6: Identification of mitigation measures:

1) The team identifies measures for the elimination (where possible) or reduction of environmental impact for the various alternatives identified in the study (e.g (a) engineering works in noise reduction; prior treatment of effluent; air pollution reduction measures; and solid waste recycling and (b) management measures to redress the impacts identified.

2) The team includes the cost of mitigation measures into the impact evaluation.

3) Where necessary, the team will suggest new alternatives based on the mitigation measures.

Stage 7: Assessment (or comparison of alternatives)

1) The team compares all alternatives on basis of economic, social-cultural and environmental gains and costs.

2) The team ranks and recommends the various alternatives to the developer on the basis of sound economic analysis.

Stage 8: Decision making by the developer:

The developer makes a decision choosing one alternative and giving reasons for rejecting other alternatives. The alternatives rejected and reasons for their rejections should be included in the report.

Stage 9: Submission of the report:

1) The team completes the environmental impact report.

2) The developer submits the reports to the environmental authority.

5. PUBLIC PARTICIPATION IN EIA

The need for public participation in EIA does not require lengthy justification. Democracy requires that all individuals should have a say in how their conditions of life may be affected by the actions of others. These actions may be in the political, social, cultural or economic fields. It follows that anything which changes environmental quality must be a subject for public discussion, debate and agreement. The imposition of change in environmental conditions without consultation and consent would be contrary to the generally accepted ethic of democracy and, in those countries where the right to a decent and healthy environment has been recognised a a constitutional right, a violation of that right.

Public participation in environmental impact assessment may be provided for at various levels.

The first is at the level of actual public input into the study. The public, particularly those persons who would be directly affected by the project, should be consulted after prior advertisement of such consultation. Where this is practicable, the inclusion of a member of the local community who is resident in the community in the study team should be considred as a way of ensuring that the views of the community continue to be represented throughout the entire EIA process.

Secondly, public participation is required in the process of reviewing the EIA study report.

Public comments on the report should be invited. The comments may be of two kinds: comments of a general nature relating to the generality of environmental concerns in the country and comments of the section of the public which is likely to be directly or most affected by the project. The second type of comment recognises the particularity of impact and the fact that those whose lives or property are particularly affected deserve special attention.

Public Hearings: If there is need for further consultations, after the public comments, a public hearing should be held to clarify public opinion regarding the project. A qualified person should be appointed to conduct the hearing. The qualification of the persons should depend on the nature of the project and the issues in contention.

6. DECISION MAKING

Decision making in environmental impact assessments is at two levels which serve entirely different purposes.

a) **Level 1: Decision Making by the Developer**

The developer is the person commissioning and paying for the EIA. In the course of the EIA, the developer has to make decisions regarding the terms of reference and the hiring of the study team. In most cases terms of reference may be required to be approved by the national authority. Most importantly, since the developer is the person responsible for funding the project, he has to make a decision regarding the alternatives suggessted for project development. The latter makes sense because the developer knows the means at his disposal and is, therefore, best equipped to make this decision.

b) **Level 2: decision making by the national authority**:

The environmental authority has the duty to make decisions in its role as the key environmental watchdog for good environmental management. It determines whether or not an EIA is required and, by participating in the making of terms of reference, determines the scope of the study and, therefore, its results.

The authority also has the duty to make the vital decision whether to approve the project or require the developer to redesign it, taking into account specified environmental factors, or to reject the project altogether. The total rejection of a project is a measure of last resort which is not usually resorted to where the project's adverse impacts can be mitigated.

A number of writers have argued against the use of EIAs by environmental authorities as a basis for approving projects. These writers view EIA simply as a tool for tool purely for facilitating business decision-making by the developer and should be viewed as part of an economic feasibility study. So viewed EIA would not be as useful in African countries where government control and direction remain relevant to the direction of the national development processes. The democratisation of decision making should not necessarily exclude social engineering and control by governments in their efforts to foster progress and promote the conservation of the environment.

7.1. GROUNDS OF DECISON

Decision making in most countries is premised on the fundamental assumption that the decision maker will be guided by sound socio-economic analysis. The socio-economic analysis relevant to the EIA process is one whereby both environmental social and economic issues are measured on the same yardstick. The developer, in choosing an alternative, has to ensure that it will be approved. In doing so he will avoid the cost of having to redesign the project.

The decision of the environmental authority is predicated on more than the economic analysis. It has to inquire into the credibility of the study and the accuracy of the predictions. As a public watchdog, such an authority must make a decision on the basis of the welfare of the people and of ensuring long-term environmental security.

There are a number of methodologies for economic analysis of EIA which may be employed. These have been the subject of extensive literature discusion.[5]

[5] (see for example World Bank; Environmental Assessment Sourcebook Vol 1 chapter 4, Washington DC, The World Bank 1991. See also Yusuf Ahmed and Sammy, Supra

7. PROCESS OF REVIEW WITHIN GOVERNMENT

The review of the EIA, whether at the prelimary assement level or the environmental impact report level reqiures a wide range of expertise. No single government agency can handle such reviews alone and it is necessary to involve the various specialized departments, ministries, and the public corporations in the review process. The contribution of local government may be may also be found useful.

The the co-ordination of the allocated roles of key departments and agencies is key to the success of the review. For the industrialist it is essential that the various relevant agencies which may be involved in the review are identified at the outset so that the study can be address their particular requirements.

8. TIERING OF PROJECTS

Tiering relates to the various levels of decision making at which EIA can be conducted. The first is the policy making level. An EIA can be conducted into the potential impacts of policy. When a specific project implementing the policy comes up an EIA may still have to be conducted into the project. However, the national authority and the developer, in drawing up the terms of reference for the EIA on the specific project, they may exclude those aspects already covered under the general policy.

9. TIME FRAMES FOR ACTIONS

The EIA involves serious business matters and an outlay of substantial sums of money. It is necessary therefre that EIA decisions be made within reasonable time frames so that delay does not unfairly penalise the developer. National laws need to provide specific time frames within which the actions required in the EIA process must be taken. Timely actions will ensure that the EIA process does not become a bottleneck to investment.

10. POST ASSESSMENT AUDITS

Subsquent to EIA, an audit may be required to determine the actual performance of the project in operation as against the predictions made in EIA. Such predictions do not always turn out to be accurate. The audit should be carried out by qualified experts, retained by the developer. The audit is essential as a means of safeguarding the developer against liability for non- compliance with environmental standards and regulations. Audits may also be used as a means of determining that the process is operating smoothly and thus to avoid accidents and other emergencies.

Certain recent legislation in Africa have set mandatory legal requirements for audits within a given period after the EIA (see for instance Uganda's draft Environmental Impact Assessment Regulations, Nov. 1997, regulation 31). In addition to self auditing the law may also empower the environmental authority to carry out compulsory audits to test the predictions made in the EIA. In many countries however, auditing is seen as an industry oriented, managed and promoted tool, rather than an enforcement tool for the authorities to use against industry.[6]

[6] see Micheal Ray Harris: "Promoting Corporate self-compliance: An Examination of the Debate Over Legal Protection for Environmental Audits" (1996) Volume 23 No. 4 Ecology law Quarterly P: 663.

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CLEANER PRODUCTION TECHNOLOGIES AND INDUSTRIALIZATION FOR A SUSTAINABLE ENVIRONMENT

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1. INTRODUCTION

Industrialization has brought with it many benefits in terms of improved economic growth. Many developing countries are eager to accelerate their processes of industrialization even though this historically has resulted in environmental degradation. Developing countries' share of total industrial output is still quite low but is expected to rise to 15 per cent of the world's total by the end of the century. Furthermore, developing countries are expected to continue to gain a larger share of the "smokestack" industries as tighter environmental standards in the industrialized nations lead to a shift of polluting industries to developing countries with less stringent environmental controls.

Global industrial growth in the last two decades has seen a higher average annual growth in manufacturing value added (MVA) for developing countries as a whole compared to that of developed countries. Even so, the benefits of this growth in industrial output have been eroded by the comparatively higher rates of growth in population resulting in a significant decline in standards of living, as measured by per capita income.

Moreover, the industry based growth sectors in developing countries have mainly been natural resource based light industries, and capital-intensive industries producing basic materials. These highly resource intensive industries - using large quantities of water, energy and raw materials - are at the same time pollution intensive, and generate a large variety of pollutants and industrial wastes, including toxic substances. This has grave implications for the physical environment in developing countries, and underlines the fact that the issue of environmental deterioration is one of the major concerns facing humankind.

Despite its potential environmental costs, the importance of industrialization for the developing countries is beyond dispute. More importantly, industrialization could itself help to provide a cure for environmental problems if an environmentally sound industrial development strategy were pursued. Strategies of that kind call for the integration of environmental concerns into industrial development plans and policies at the initial stages of formulation.

Industry is sustained by the extraction and processing of natural resources as raw materials. These same raw materials find their way into the environment in different forms as finished products and waste products. Natural resources are fragile and need to be managed rationally so that, in meeting the needs of the present generations, the welfare of future generations is not compromised.

Sustainable development requires that industry equate economic and environmental interests so that "quick money" does not become the only yardstick for measuring the success of an industrial enterprise. Industry can contribute positively to sustainable development if economic instruments and market mechanisms in which the prices of goods and services reflect the environmental costs of their production, use, and disposal are relied upon.

Industry plays a crucial role in the social and economic development of a country. A stable policy regime enables and encourages industry to operate responsibly, efficiently and to implement long term policies. Through more efficient processes,

preventive strategies, cleaner production technologies and procedures throughout the product's life cycle (hence avoiding or minimizing wastes), industry can contribute substantially to reducing its negative impact on resource use and the environment. Technological innovations and development, application, and transfer are to a very large extent within the scope of industry.

Industry should recognize environmental management as among the highest corporate priorities and as a key determinant to sustainable development. Some enlightened executives of enterprises are already implementing "responsible care" and product stewardship policies and programmes, fostering openness and dialogue with employees and the public and carrying out environmental audits and assessments of compliance. These leaders are increasingly taking voluntary initiatives and promoting and implementing self-regulation to minimize the impact of their activities on human health and the environment. The regulatory regimes introduced in many countries, the growing consciousness of consumers and the general public and the actions of the enlightened leaders of industry have all contributed to an improvement in industry's management of its impact on the environment.

The improvement of production systems through technologies and processes that utilize resources more efficiently and at the same time produce less wastes is an important step towards the achievement of sustainability by industry. Similarly, facilitating and encouraging inventiveness, competitiveness and voluntary initiatives are necessary for stimulating more varied, efficient and effective options.

Governments are increasingly realizing that "command and control" approaches to environmental management have severe limitations. It is now widely acknowledged that market-based incentives and voluntary compliance by business enterprises should go hand in hand with legislative measures and consumer awareness.

There is increasing recognition that production, technology and management that use resources inefficiently create wastes that are not reused and that have adverse impacts on human health and the environment. Such technology and management need to be replaced with technologies and management practices that would minimize waste generation throughout the product's life cycle. The concept of cleaner production implies striving for optimal efficiency at every stage of the product's life cycle. This is likely to result in an improvement of the overall competitiveness of the enterprise.

The need for a transition towards cleaner production policies was recognized at the UNIDO - organized Ministerial Conference on "Ecologically Sustainable Industrial Development" held in Copenhagen in October 1991. The term "cleaner production" was adopted in Canterbury in 1990 at the first UNEP Cleaner Production Seminar.

Cleaner production can minimize or eliminate the need to make trade-offs between economic growth and environment, between worker safety and productivity, and between consumer safety and competition in the marketplace. This leads to a "win-win" situation in which everyone gains. Cleaner production is a "win-win" strategy: it protects the environment, the consumer and the worker while improving industrial efficiency, profitability and competitiveness. Cleaner production is also now especially attractive to developing countries and those undergoing economic transition because it provides them with an opportunity to leap frog over older, more established industries which are still saddled with costly pollution technologies. Countries which adopt cleaner production now will be able to take full advantage of a rare window of opportunity which favours industrial development in poorer countries over industrialized nations.

While acknowledging the role of business and industry in producing a wide range of goods, fostering economic growth, generating employment, and sustaining the growing world population, the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro brought to the fore the need to pursue equitable and sustainable development both at the micro-and macro-economic levels. It is in this context that UNCED endorsed and adopted Agenda 21 as its plan of action to strengthen the role of business and industry in facilitating the achievement of sustainable development through the promotion of cleaner production and responsible entrepreneurship.

2. ECOLOGICALLY SUSTAINABLE INDUSTRIAL DEVELOPMENT

The United Nations Industrial Development Organization (UNIDO) defines ecologically sustainable industrial development (ESID) as:

"patterns of industrialization that enhance the contribution of industry to economic and social benefits for present and future generations without impairing basic ecological processes."

These new and sustainable patterns of industrial development focus on the concept of "eco-efficiency", that is, the efficient utilization of non-renewable and renewable resources within the limits of the waste assimilative capacities of ecosystems. They differ depending on a country's resource endowments and stage of economic development.

Ecological processes at risk are those threatened by the pollution of air, water and soil; the destruction or alteration of habitat; the loss of wild species; and fundamental changes in geochemical, hydrological and climatic cycles. Further-more, human health and safety are major concerns at all times.

ESID strategies are based on a holistic approach that brings the environmental dimension to bear on all planning, policies and expenditures related to industry. The approach stresses the correction of the market failures in the undervaluation of environmental services and the elimination of policy failures that encourage excessive use of resources. The solutions to these complex interrelated problems go beyond the abilities of individual economic actors. The integration of environmental and industrial policies requires encouraging the proper functioning of market mechanisms without adversely affecting the objectives of industrial growth.

To contribute to the achievement of ESID, the following objectives should be taken into account:

Eco-capacity: use of non-renewable resources at a rate guided by the availability of substitutes; use of renewable resources at a rate limited to their natural or managed regeneration rates; and the dispersion of industrial wastes at a rate limited to the assimilative capacities of ecosystems, thus preventing irreversible effects on basic life-support systems.

Precaution: adherence to the precautionary approach, which calls for environmental measures that prevent environmental degradation and attack its causes, thus anticipating threats of serious or irreversible damage;

Anticipation: development of procedures for accident prevention, thereby reducing the risks and potential losses associated with environmental emergencies;

Prevention: prevention of pollution at its source in products and manufacturing processes rather than remedying the damage after the pollution has occurred;

Efficiency: minimization of resource consumption per unit of output, thus ensuring efficient use of man-made and natural capital; and

Equity: provision of opportunities for all countries to participate in the industrialization process and to benefit from the wealth generated by industrial activities; and of equality of opportunity between genders, and present and future generations.

3. CLEANER PRODUCTION

Developing countries face a dilemma today. While economic development is solving problems of poverty it is also causing new environmental problems. As a result air, water and land become more polluted and degraded, and in the more industrialized developing countries, there is already a need for clean-up operations. Cleaner production can provide solutions to some of these problems, but it requires international cooperation and new policies in the field of industry and the environment that provide incentives to adopt the cleaner production approach.

Over the past thirty years, the industrialized nations have responded to pollution and environmental degradation in four ways: by ignoring the problem; by diluting or dispersing the pollution so that its effects are less apparent; by trying to control the pollution and the wastes through "end-of-pipe" pollution control approaches; and, most recently, by cleaner production through prevention of pollution and waste generation at source. The sequence of "ignore, dilute, control and prevent" is one which has culminated in an activity which combines maximum positive effects on the environment with substantial economic savings for industry and society. Achieving this is, essentially, the goal of cleaner production.

With time the world has come to appreciate more the pressure that pollution puts on the natu-

ral resources and human health. Europe annually produces twenty million tones of solid waste which is regarded as hazardous. Traditional methods of dealing with such volumes of wastes have not been successful, and the resulting contamination of water and land has led to pressure on government and industry to improve the situation. Environmental impacts are increasingly regarded as unacceptable; standards are tightening and disposal costs are increasing. In order to come out of this impasse, governments and industry are now more seriously trying to find a way to avoid producing wastes and emissions altogether.

This re-examination is happening at a time when increased market competition is, in any case, forcing companies to make improvements in production efficiency, and generally to look for cost-cutting measures. Simple calculations of the market value of chemicals that have been flushed down the drain support the long-held view of ecologists that emissions, effluent and other residues, in addition to being pollutants, are wasted resources.

"Cleaner production" is a general term that describes a preventative approach to industrial activity. It is a broad term that encompasses what is otherwise known as pollution prevention, waste minimization, waste avoidance, zero-emission, etc.. But it also includes something extra. Cleaner production refers to an approach as to how to produce goods and services with the minimum environmental impact under current technological and economic limitations. It acknowledges that production cannot be perfectly waste-free but that industry can do better than in the past, and that off-site recycling and effluent treatment by themselves do not constitute cleaner production.

The definition of cleaner production that was adopted by UNEP is:

> **"Cleaner production is the continuous application of an integrated preventative environmental strategy to processes, products, and services so as to increase efficiency and reduce the risks to humans and the environment".**

It is important to focus on the manufacturing process and also to take a life-cycle approach to products and services. Cleaner production includes the efficient use of raw materials, water and energy, the elimination of toxic or hazardous materials, and the reduction of emissions and wastes at source during the production process. As far as products and services are concerned, the strategy focuses on reducing impacts along the entire life-cycle of a product, from design through manufacturing and use to ultimate disposal.

The major difference between pollution control and cleaner production is the time of intervention. Pollution control is an after-the-event, "react and treat" approach while cleaner production is a forward looking, "anticipate and prevent" philosophy. Prevention, as is well known, is always better than cure. This is not to say that "end-of-pipe" technologies are not required. The new approach tackles problems using a cleaner production concept, which leads to better selection and planning of technology. This, in turn, leads to a reduced need, and, in some cases, the elimination of the need, for end-of-pipe technologies.

Cleaner production can be achieved in a number of different ways of which the three most important ones are changing attitudes; applying know-how; and improving technology. It is important to stress that cleaner production is not simply a question of changing technology. It involves changing attitudes, which means finding a new approach to the relationship between industry and the environment. Simply re-thinking an industrial process or product in terms of cleaner production may produce the required results without having to introduce new technology.

Applying know-how means improving efficiency, adopting better management techniques, changing house-keeping practices, and revising policies, procedures and institutions as necessary. The many ways of improving technology include changing process or manufacturing technology; changing input materials; changing the final product; and re-using materials on-site, preferably within the process (off-site recycling is not part of cleaner production, though it may bring substantial environmental benefits).

Industry may be richly rewarded for taking preventive environmental action in the form of cleaner production. Experience in both developed and developing countries shows that this new approach not only produces a cleaner environment but also results in substantial savings for industry and society at large. Cleaner production can be, and has already been, applied to raw materials extraction, manufacturing, agriculture, fisheries, transportation, tourism, hospitals, energy, information systems (e.g. in process control) and the organization of work.

3.1 Why Cleaner Production?

Investing in cleaner production to prevent pollution and to improve natural resource use is cheaper than continuing to rely on increasingly expensive end-of-pipe or pollution control technologies. The initial investment for pollution control and cleaner production processes may be similar, but over time pollution control costs continue to mount while those of investing in cleaner production level off. By 1989, the OECD countries alone were spending US $ 22 billion a year to control 310 million tones of hazardous wastes generated every year!

As has already been pointed out, cleaner production is quite distinct from the traditional pollution control strategies which rely on "end-of-pipe" technologies. Cleaner production is inherently preventive whereas pollution control strategies accept waste, emissions and effluent as inevitable and try to find ways to minimize their effects. Pollution control technology, once purchased, is often not properly maintained and its future environmental benefits can therefore be illusory. This is the inevitable result of a technical fix that seeks to treat the symptoms of a problem rather than address its causes. When cleaner production technologies and pollution control options are compared, cleaner production options will usually be less costly to implement, operate and maintain over the long term because of reduced costs for raw material, energy, pollution control, waste treatment and clean-up, and regulatory compliance. Payback times can vary between a few months to a few years. In addition, the environmental benefits and performance are greater. This latter benefit can be translated into market opportunities for "greener" products.

Systems and products for which good environmental performance has been factored in at the design stage will be cheaper to operate and maintain, as well as less polluting, and therefore less harmful to human health. Cleaner production provides industries with a new range of benefits. It also introduces them to new tools such as Life Cycle Assessment (LCA) and eco-labelling. Cleaner production is now especially important for developing countries, many of which are expanding industrial production quickly. This is clear from the striking increase in chemical exports to developing countries, which almost doubled their share of worldwide trade in chemicals from 7.4% in 1980 to 12.9% in 1991. With industries expanding at this rate, it becomes imperative that developing countries seize the opportunity to invest relatively cheaply in cleaner production now rather than pay heavily later on for clean-up operations, as the industrialized nations have had to do. Doing so will also provide developing countries with a competitive edge over established firms which are encumbered with expensive end-of-pipe control technologies.

It is often claimed that cleaner production technologies do not yet exist and that, where they do exist, they are already patented and can be obtained only through expensive licenses. Both statements are untrue. Cleaner production approaches are widely and readily available, and techniques do exist for identifying and evaluating needed technologies. While it is true that cleaner production technologies do not yet exist for all industrial processes, it is estimated that 50% of all current wastes and emissions from industrial processes can be prevented at source by the use of technically sound and economically profitable procedures. Secondly, cleaner production depends only partly on new or alternative technologies. It can also be achieved through improved management techniques, different forms of work organization and many other "software" approaches to industrial production and processes. Cleaner production is as much about attitudes, approaches and management as it is about technology. This is why it is called cleaner production and not cleaner technology. A good example of this occurred at the Beijing Brewery in China, where, for example, cleaner production techniques reduced beer losses by nearly 20% providing annual savings of US $ 200,000 while at the same time reducing the chemical oxygen demand on waste waters. These changes required no investments, only management improvements.

Cleaner production is a means of improving industrial performance and protecting the environment. But it is equally an effective device for complying with the complex array of rules and regulations designed to protect the environment. This is true, for example, for municipal government regulations that specify levels of permitted discharges into the air and water. But it is also true of the new and more demanding requirements for international adherence to conventions on ozone-depleting substances, the discharge of toxic materials, climate change and bio-diversity. Industries and nations that embrace cleaner production approaches will find that, in so doing, they will more easily fulfil many of their international environmental obligations.

An enterprise adopting cleaner production processes may realize one or more of several benefits, while reducing industrial pollution: savings

in raw materials and energy; decreased waste management costs; improved product quality; enhanced productivity; decreased down-time; reduced worker health risks and environmental hazards; decreased long-term liability for the clean-up of waste materials; and improved public image for the company.

3.2 Cleaner Production in Industry

The development of preventive actions can only occur when the problems are specific. Cleaner production assessment methodologies are used systematically to identify areas of cleaner production so that options for potential preventive actions can address the most important sources first. The consecutive steps of a cleaner production assessment are: recognized need for cleaner production; planning and organization; pre-assessment; assessment; feasibility study; implementation and ongoing cleaner production activities. The main focus is to generate options for reducing wastes and emissions at their source. The same approach is applicable to the generation of options for reducing risk and energy consumption.

A *cleaner production assessment* is initiated after a conscious decision has been made by the management to take some action. The first step is to form the project team, discuss the programme with workers and supervisors (who will need to provide the data) and document the main processes to be studied. It is important to pay attention to psychological aspects of the study, as workers will be reluctant to provide information if they believe they will be punished for process inefficiencies. With the data obtained from plant records, and other information sources, the project team prepares a material balance sheet of raw materials, auxiliaries, energy, products, by-products, wastes and emissions. From this it is possible to determine the main sources of wastes and emissions. Although the concept itself is simple, the necessary information for preparing a good material balance sheet is often difficult to come by; many companies do not keep good records of their operations, including discharges.

During the *assessment phase*, the material balance sheet is studied and appropriate measures are proposed to prevent or reduce the loss of materials. It is at this stage that the project team will use all available means to identify cleaner production options. The ideas for options may come from literature search, personal knowledge, discussions with suppliers, examples in other companies, specialized data bases or the results of Research and results. A creative intellectual environment to think of all possibilities based on the widest possible experience is often needed; brainstorming sessions are regularly used at this stage.

As mentioned above, *generating options* is a creative process that relies more on inspiration than on logical deduction (although logic remains important). The brainstorming session exploits both creativity and common sense. Before commencing on the brainstorming session, literature searches should be done, other organizations and companies should be consulted, and a site visit made so that the generation of options can be made more effective. One should focus on all influences on the process that could lead to the generation of wastes and emissions. Brainstorming sessions have proved to be most effective when managers, engineers, process operators and other employees as well as outside consultants work together without constraints brought on by considerations on hierarchy.

During the cleaner production assessment a number of possibilities for immediate improvements could already have been identified. In order to proceed in a systematic manner, it is often helpful to conceptually divide the process into several essential elements, as follows: good operating practices; change in raw materials; technological change; product changes; and on-site reuse and recycling. Each elements are considered in turn.

Good operating practices, also referred to as good housekeeping practices, imply procedural, administrative, or institutional measures that a company can use to minimize waste and emissions. Many of these measures are used in industry largely as efficiency improvements and good management practices. Good operating practices can often be implemented in all areas of the plant, including production and maintenance operations, and in raw materials and product storage.

Good operating practices include management and personnel practices; material handling and inventory practices; training of employees; loss prevention; waste segregation; cost accounting practices; and production scheduling. By analyzing these factors, the departments or groups that generate the wastes and emissions become more aware of the effects of their treatment and disposal practices, and get a financial incentive to minimize their wastes and emissions. Through judicious scheduling of batch production runs, the frequency of equipment cleaning and

the resulting wastes and emissions can be reduced.

Changes in raw materials accomplish cleaner production by reducing or eliminating the hazardous materials that enter the production process. Also changes in input materials can be made to avoid the generation of the hazardous wastes within the production process. Input materials changes include materials purification and substitution.

Technology changes are orientated toward process and equipment modifications to reduce waste and emissions primarily in a production setting. Technology changes can range from minor changes that can be implemented in a matter of days at low cost, to the replacement of processes involving large capital costs. These include changes in the production process; modification of equipment, layout, or piping; use of automation; and changes in process conditions, such as flow rates, temperatures, pressure, and residence times.

Product changes are performed by the manufacturer of a product with the intention of reducing waste and emissions resulting from a product's use. Such changes include changes in quality standards, product composition, product durability and product substitution. Product changes can lead to changes in design or composition. The new product can be made less environmentally damaging throughout its life cycle, i.e. from raw material extraction to final disposal.

On-site reuse or recycling involves the return of a waste material either to the originating process as a substitute for an input material or to another process as an input material within the premises of the enterprise.

After the options have been generated, an initial selection should be made, considering availability, sustainability, environmental and health effects and the economical feasibility. This initial selection should take place before the cleaner production option is subjected to more thorough evaluation. During the feasibility phase the evaluation will result in a selection of options for implementation. The implementation phase of the options has to be followed by monitoring of the changes, in line with the concept of cleaner production, followed by a new assessment which will be used to identify new options for cleaner production.

3.3 Cleaner Production in Practice

The following are some examples of the impact of cleaner production in practice:

At the Beijing Brewery in China, cleaner production techniques reduced beer losses by nearly 20 per cent, providing annual savings of US $ 200,000 while at the same time reducing the chemical oxygen demand (COD) of waste-waters. These changes required no investments, only management improvements (good-housekeeping practices);

A cement company in Indonesia has used cleaner production techniques to improve process control, thus savings US $ 350,000 a year - payback period was less than one year;

A metal treatment company in Singapore installed a new cleaner production process that saved US $ 87,000 a year - the payback period was two years;

The decision to recycle chromium in a Greek tannery reduced chromium pollution and waste from 30 to 4 per cent, and saved US $ 43500 a year -the payback period was 11 months.

A brewery in Tanzania applied cleaner production techniques by installing a water metering device at the facility's inlet pipe and reduced the water consumption bill by 64 per cent, making a saving of US $ 230,000 per year. Apart from the procurement of the meter, no other investment was required.

4. BARRIERS TO CLEANER PRODUCTION

4.1 Ecologically Sustainable Industrial Development

In both developed and developing countries alike there are barriers to the achievement of ESID. These include information gaps and deficiencies; limitations in scientific, technological, professional and related institutional capacities to support the process of transition to ESID; political and economic obstacles; and links between short-term economic costs and long-term economic benefits or environmental protection.

Regulatory and monitoring capacity and skilled personnel may not be adequate for dealing with new problems. Small - and medium scale industries have limited information and lack the skills and capital needed to implement cleaner production processes. Political and social constraints often limit the setting of economically appropriate prices for water, energy and raw materials. States may ignore the consequences of industrial activity that result in damage being done outside of their borders. Finally, the poor, the disadvantaged and the vulnerable tend to suffer most from environmental degradation, but lack the political influence required to bring about the introduction of remedial measures.

These obstacles to the implementation of ESID - related measures are even more acutely felt in developing countries. Weak institutional capacity, particularly the ability to implement and coordinate programmes, and shortages of skilled personnel are major problems in developing countries. Even if where industry wants to invest in more environmentally sound technologies, it will often be faced with financial constraints. The scarcity and high cost of capital may preclude importing the technologies, even if the investments are economically justified. Lastly, a big part of the population lacks the awareness, education and experience needed to deal with environmental problems, and the few non-governmental organizations (NGOs) that are involved in such matters lack political influence.

The obstacles facing developing countries in achieving ESID can, in part, be traced to their indebtedness which results in shortages of capital needed to finance cleaner production processes. Developing countries also have limited capacity to absorb cleaner production practices, which is attributable, in part, to their lack of technical and scientific capacity. A third issue is the potential risk of new non-tariff barriers emerging as a side-effect of new environmental measures that, in effect, close markets to exports from developing countries. Keeping markets open to manufactured products from developing countries will provide such countries with better conditions for the repayment of debts to developed countries.

4.2 Cleaner Production

Many companies and countries have shown a reluctance to adopt cleaner production technologies. Analysis has shown that reasons for not adopting cleaner production at national level can be classified into three main categories as follows: political (60%), financial (30%) and technical (10%). Thus, the largest obstacle is political which includes bureaucratic resistance, human conservatism, uncoordinated legislation, media sensationalism and public ignorance and/or misinformation. The financial aspect consists of subsidies given to environmentally unsustainable options, scarce financial resources and an entrenched disposal industry. Technical reasons include a lack of reliable information and of assistance in tailoring cleaner production technologies to individual needs.

At the company level cleaner production programmes usually encounter barriers of both a general and specific nature. General barriers stem from prevailing attitudes and the lack of information. These two sources of general barriers, often the most difficult to tackle, have to be overcome first before the specific barriers are addressed. Specific barriers can be institutional, economic or technical; these also inhibit the development of cleaner production at the enterprise level.

The negative attitudes to cleaner production which prevail can originate from resistance to change; a failure to attach importance to the to the environment; lack of vision; the assumption that the process is a "sacred cow"; and too much focus on compliance. Lack of information dissemination can be attributed to the way the information is generated (single medium as apposed to multi-media approach) and disseminated and to the general reluctance to accept new information.

Three levels of institutional barriers can be identified. They are organization of the company, the relationship of the company with other companies, and the impact of national policies. Common economic barriers include the incorrect allocation of environmental costs, and pricing policies for raw materials, energy, waste and emissions and investments. Technical barriers can be identified at the three levels of technology development, testing of technologies and dissemination of technologies.

5. INDUSTRY INITIATIVES

Through the International Chamber of Commerce and its international and national associations, industry has pledged its support for principles of sustainable development. Industry regards sustainable development as a goal that requires real economic growth, since only such growth can create the economic and technical capacity to solve environmental problems. At the Second World

Industry Conference on Environmental Management, held in Rotterdam from 10 to 12 April 1991, industry declared its willingness to work towards a continuous improvement of environmental performance.

It is in industry's own interest to adopt a course of action leading to ESID. Industry can maximize profits by increasing efficiency while at the same time maintaining environmental concerns. Pollution prevention is more environmentally effective, technically sound and economical than conventional controls. Industry can develop and utilize clean production processes and produce greener products. The full cooperation of all concerned is needed to avoid irreversible adverse effects on humans or the environment.

The trend towards using greater transparency as a means of securing public confidence in, and support for, operations has been observed in several sectors. Industry's strategy might include the following elements:

Adoption of pollution prevention, an approach that prevents pollution at its source in products and manufacturing processes rather than removing it after it has been created.

Integration of environmental concerns into decision-making at all management levels; introduction of waste minimization and environmental compliance auditing; establishment of emergency, risk and safety management systems; and establishment of training programmes.

Adherence to voluntary environmental codes of conduct for industrial investment and production.

Increase of research and development activities with emphasis on cleaner production technologies, giving priority to technologies that offer potential for improved efficiency and reduced pollution; provision of training facilities to developing countries.

Consideration, where feasible, of the use of substitute materials and product reformulation; process modification and the redesign of equipment; the use of renewable sources of energy and raw materials; recycling and reuse of waste materials.

Assumption of a "cradle-to-grave" approach to industrial production.

Application of cleaner industrial production processes and more rational use of natural resources.

Transfer and adaptation of environmentally sound technologies, know-how and skills to meet the needs of developing countries and mobilization of financial resources for this purpose.

Encouragement of large-scale industry to provide information on environmentally sound management and energy conservation.

Principles for achieving ESID have been embodied in the Criteria for Sustainable Development Management prepared by the United Nations Center on Transnational Corporations. The following elements of the criteria are also embodied in the Business Charter for Sustainable Development, adopted by the Executive Board of the International Chamber of Commerce at its sixty-fourth session on 27 November 1990: corporate priority; integrated management; process improvement; employee education; prior assessment; products and services; customer advice; facilities and operations research; precautionary approach; use of environmentally conscious contractors and suppliers; emergency preparedness; transfer of technology; contributing to the common effort; openness to environmental concerns; compliance; and reporting.

Industrial associations and chambers of commerce could promote environmental practices that go beyond the minimum legal requirements and regulations. They could also organize training programmes, advise public authorities and facilitate the sharing of non-proprietary information and technology. Similarly, the environmental issues pursued by trade unions, consumer associations, women groups and community groups working with industry and other organizations could have a major effect on how industry develops its strategy.

6. THE ROLE OF GOVERNMENT

6.1 Ecologically Sustainable Industrial Development

If, through imperfections, the market fails to deal adequately with the environment, government initiatives and intervention may be required to achieve ESID. Such market failures arise when the interests of industry are not consistent with

those of society. The achievement of ESID requires the assertion of environmental concerns through industrial policies and strategies adopted by Governments.

Governments need an industrial policy that supports the development, promotion and diffusion of pollution prevention and cleaner production processes. Government should develop a transparent information policy concerning the environment and should support education, training and research programmes to raise public capabilities and awareness.

Government intervention may be through regulations and market-oriented incentives. Regulations involve a complex mixture of standards, permits, and monitoring and enforcement that, taken together, are frequently termed a "command-and-control" approach. In developed countries, noteworthy successes have been achieved using this approach. But regulations alone will not be efficient in achieving ESID and, in recent years, it has been augmented with market measures and voluntary measures, such as the use of economic incentives, pollution prevention, waste minimization and cleaner production technologies.

One of the conditions for maximum efficiency (both traditional economic efficiency and environmental efficiency) is that prices of products and services must reflect their full social and economic costs. It is not always possible to accurately determine those costs. Market-based economic instruments, such as taxes, fees and tradeable permits, however, give industry a direct financial incentive to reduce pollutant discharges in the most cost-effective manner. Combining a mixture of market-based incentives with a regulatory approach has cost-saving potential. Flexibility on the part of Governments in allowing industry to choose the timing of pollutant reductions and the methods to be used to achieve such reductions may result in industry adopting cleaner production processes that go beyond meeting traditional environmental standards.

An important factor to be considered is the relationship between environmental policies and economic and social policies. Governments need to be aware, for example, of the repercussions of tax and subsidy policies in general on the use of resources, and on the environment. They need to ensure that such policies, aimed perhaps at export promotion, do not encourage behaviour that would have an adverse effect on the environment.

In addition to strictly environmental regulations, industry is subject to complex regulations in areas such as occupational safety, health, planning and economic zoning, wildlife and marine life protection and conservation.

Environmental intervention requires institutional capability, which is often lacking, particularly in developing countries. Consequently, policy instruments, such as tax policy, resource-pricing and withdrawal of subsidies, may be needed in order to achieve economic and environmental objectives simultaneously.

Community associations, women's organizations and NGOs have, in many instances, played an important role in increasing public awareness and behaviour with respect to environmental questions. A Government designing an ESID - oriented policy should consider proposals and ideas relevant to manufacturing industry that have been suggested by such associations and organizations.

6.2 Cleaner Production

While it is industry that ultimately must implement cleaner production, the role of government is to lead by providing a conducive environment that will accelerate the process and encourage industry to initiate its own cleaner production programmes. The range of tools available to governments trying to catalyze industry to adopt cleaner production is large and countries select the combinations of tools they regard as most suited to their needs.

The tools available include establishing cleaner production programmes; requiring cleaner production audits; publishing environmental performance data; providing technical assistance; revising existing laws and regulations; enacting new regulations; changing permitting systems; encouraging voluntary pollution reduction schemes; introducing special enforcement provisions; changing use of technology standards; providing subsidies; offering grants for the development of cleaner production technology; and investing revenues from waste treatment fees and taxes in cleaner production. These and other tools can be classified into four main: applying regulations, using economic instruments, providing support measures, and obtaining external (international) assistance.

In industrialized countries, regulatory programmes are the foundation on which environ-

mental quality has been built. These countries have relied mainly, though not exclusively, on what is known as "specified compliance"; precise and specific demands have been imposed on the regulated communities, with little bargaining allowed and few exceptions made.

This somewhat authoritarian style of government has undoubtedly been successful in improving environmental conditions. However, it has its drawbacks. The regulated community tends to become alienated and united in the opposition to the rule makers. Furthermore, this approach encourages the use of expensive pollution control technologies, the adoption of which often reduces the budget available for promoting cleaner production. Adapting, testing and putting such techniques into practice can also take as long as implementing cleaner production. Once a pollution control device is in place, there is little incentive to spend more money to reduce the need for the device. The "negotiated compliance" approach, by contrast, seeks to obtain compliance by the use of general and flexible guidelines and bargaining between the regulators and the regulated. This less adversarial approach, of which the ultimate expression is the voluntary agreement or code of conduct, may be more useful to governments trying to promote cleaner production over the long term. In very broad terms, experience in industrialized countries suggests that specified compliance is the preferred option to achieve urgent, short term goals while negotiated compliance may be preferable over the long term. But no government currently relies exclusively on either approach.

Economic instruments can be used to make the cost of pollution more expensive than the cost of cleaner production. They exist in two forms: those that provide subsidies for compliance, such as tax rebates, and those that penalize non-compliance, for example through fines. The revenue generated through the latter should be used, at least partially, to help develop cleaner production approaches.

Economic instruments can be used to shape and direct technological investment, the purchase of materials and energy and the management of pollution and waste. They can provide incentives for cleaner production or they can, if unwisely fashioned, subsidize pollution control or environmentally harmful industrial activity through, for example, inappropriate taxes and subsidies. The range of economic instruments includes taxes, reporting requirements, tax rebates, and subsidies. Carefully implemented, they discourage pollution technologies. In theory economic instruments internalize the social cost of production by imposing an economic cost or penalty for polluting. They also improve the economic rewards for adopting or developing cleaner production relative to production systems using polluting technologies.

Before economic instruments are applied, governments need to analyze what forms of economic instruments are already in operation. These can include forms of subsidy used to lower production costs and make industry more competitive with imports and foreign products in general. Many such policies lead to artificially low prices for resources such as energy and water. As a result, these resources are often used profligately, creating both pollution and shortages. In general, policies that result in prices that reflect the real costs involved should be implemented before additional economic instruments are employed.

Although industry is the prime mover in implementing cleaner production, government support can play a critical role, providing just that bit extra that industry needs to be persuaded to take the plunge. Attention should be directed at four key areas: providing information about both the technology involved and the environmental tools industry needs to make cleaner production assessment of its activities and products; organizing training on cleaner production; helping to change educational curricula in order to integrate the environmental dimension in all engineering and business management courses; and assisting key institutions in government, industry and non-governmental organizations.

International assistance to developing countries can take the form of financial aid or transfer of information and know-how, education, training and hardware. The extent to which the transfer of financial, intellectual and technical resources fosters self-reliance is of key importance in these activities. Capacity building through technology cooperation must enhance the recipient country's ability to manage technological changes, and permeate the culture rather than exist as an isolated capability in government agency or industry.

7. CONCLUSIONS

The traditional pattern of industrial development is not sustainable over a long period because it threatens the basic conditions of life support on

earth by placing at risk the ozone layer, the global climate and key cycles of nature, including the deposition and use of oxygen, carbon, nitrogen, phosphorus and sulphur. Industry is a major cause of the present disequilibria in the biosphere. It is a major source of the energy-related pollutants CO_2 and SO_2 and a significant source of chemical releases to the environment.

While in the past industry in developed countries has been the largest contributor to these problems, developing countries will come to play an increasing role as they continue to industrialize. There is a strong positive correlation between energy and raw material consumption and industrial output in developing countries. If present trends continue, the share of global air pollutants and toxic chemicals emitted by developing countries will increase significantly in the years to come.

To avoid further risks to the biosphere and to the sustainability of the industrial development process, the world needs new patterns of industrialization. These new patterns of industrialization, ESID, must be ones that enhance economic and social benefits for current and future generations without impairing the basic ecological processes. ESID would be characterized by limitations on industrial activities to protect the biosphere, the efficient use of man-made and natural capital and, in the social sphere, equity as a basic principle in the transition to a sustainable society.

The key to achieving ESID is the introduction and broad application of cleaner production methods. Cleaner production looks to all aspects of the product life cycle. Cleaner production is at the same time a new environmental quality goal and a new approach to achieving that goal. The new goal would require industry to move beyond meeting ambient standards to stabilizing and then reducing total loadings of pollutants of global concern. The new approach would turn the traditional environmental management scheme upside down by assigning priority to source reduction (product and process modification), recycling and reuse as the primary options for mitigating the environmental impact. Conventional pollution control technology, while it would still be used, would, in the longer run, be replaced by prevention technology.

Since the adoption of cleaner production technologies at the establishment level is only part of ESID, it is perhaps eve more important, in the long run, to initiate major changes in the structure of the world economic system. These necessary changes include sharply reduced dependence of fossil fuels, especially coal, and sharply reduced dependence on non-renewable mineral resource, especially toxic heavy metal ("closing the materials cycle"). These changes cannot be accomplished solely by direct command and control methods. Rather, the relevant economic incentives under the control of governments (taxes, tariffs, subsidies and institutional arrangements) must be re-examined and modified appropriately.

Developing countries, which in many cases are still at the beginning of the industrialization process, have a unique opportunity in adopting cleaner production. They have a chance to introduce technologies that are more resource-efficient and less disruptive of the environment than the existing technologies used in developed countries. Moreover, it is significantly cheaper to incorporate cleaner production methods when new plants are being built than to introduce such methods in existing plants.

The mutuality of interests between developed and developing countries in achieving ESID through cleaner production provides a compelling argument for North-South cooperation and for supporting South-South cooperation. Many cost-effective measures for reducing threats to the biosphere that are possible in the South will not take place unless the North expands its technical cooperation (transfer of knowledge and expertise) and its financial assistance. Managing the transition to an ecologically sustainable economy should involve all sectors of industry and should be done on the basis of clear targets, appropriate time-frames and financial incentives to support the transition process.

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REFLECTIONS ON THE ROLE OF INDUSTRY IN THE PROMOTION OF COMPLIANCE WITH ENVIRONMENTAL REGULATIONS IN KENYA

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1. INTRODUCTION

Industry depends on the prosperity and well being of the people and communities they serve. It is in the interest of industry to preserve the sustainability of the environment in which these communities live.

Recent research conducted in six European countries has confirmed that consumers consider the state of the environment to be as important as unemployment, crime and drugs. It also showed that consumers see industry as primarily responsible for the degraded state of the environment. If similar research was to be conducted in Kenya, it would most likely yield similar results.

I have been asked to share my reflections on the role of industry in the promotion of compliance with environmental regulations in Kenya. In doing so I will draw heavily on the commitment and approach of Unilever - the parent company of East Africa Industries here in Kenya - on environmental sustainability.

Industry should, and many have, recognized that economic and social aspects need to be linked with environmental action.

Industry should aim to produce safe products from clean processes, and as efficiently as possible. This philosophy is expressed well in the term **eco-efficiency** which is now widely used. This is the first building block for industry's role in the promotion of compliance with environmental law. Compliance is a continuous process and all of industry must join in if industry is to play its rightful role in spearheading compliance in environmental law in Kenya.

2. ECO-EFFICIENCY

Narrowly defined, **eco-efficiency** is about producing more with less resources and with less pollution. However it goes further to make business more competitive, innovative and environmentally responsible. The goal is to create added value for both society and the company by doing more with less over the product or service life cycle. Thus eco-efficiency is reached through the delivery of competitively priced goods and services that satisfy consumer needs and enhance the quality of life while progressively reducing ecological impact and resource use intensity throughout the product's life cycle to a level in line with the earth's/country's estimated carrying capacity.

Eco-efficiency encourages new ways of working without immediately abandoning traditional practices. Instead it aims to harness the business concept of value creation and links it to environmental concerns. Environmental responsibility should therefore not be seen to be in conflict with sustainable economic development or with industrialization.

As Kenya moves towards the stated objective of being a Newly Industrialized Country (NIC) by the year 2020, environmental responsibility MUST be part of the industrialization process. In order to achieve this, existing and new industries must adopt the following concepts:

- Reduce the raw material intensity of goods and services.
- Reduce the energy intensity of goods and services.
- Enhance raw material re-cyclability

- Reduce/eliminate toxic dispersion.
- Maximize sustainable use of renewable resources.
- Extend product durability.
- Increase the services intensity of goods and services.

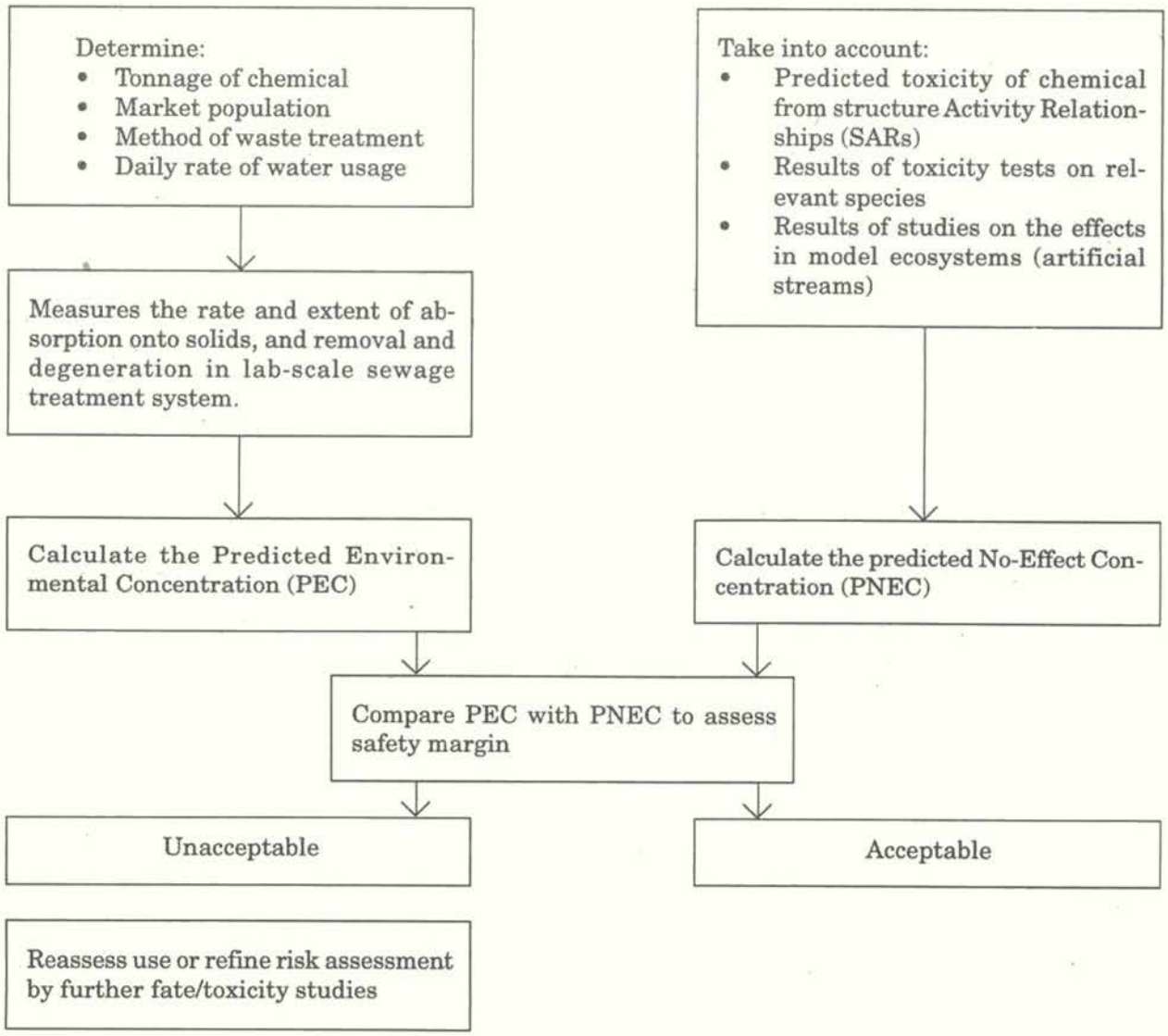
Industrial establishments must support for sustainable development in their corporate strategies. Companies must build into their manufacturing strategies the following:

(a) Environmental Risk Assessment

Before an industrial establishment puts a new product into the market, an assessment should be done to ensure that the substances contained in the product do not pose an unacceptable risk when are used or disposed of. This is done by predicting the concentration of the substance and any degradation products that will occur at any key points in the environment (e.g. rivers receiving sewage discharges, and agricultural land receiving sewage sludge), and the potential impact of such concentrations.

Shown diagrammatically environmental risk assessment procedure is as per the attached diagram.

UNILEVER'S ENVIRONMENT RISK ASSESSMENT PROCEDURE



To ensure predictions are as accurate as possible, in critical cases (e.g. new frontiers of technology), studies should go beyond laboratory tests of biodegradability and toxicity. Sewage treatment operations can be simulated in the laboratory and in a pilot scale plant and the fate and effects of substances studied in model ecosystems such as artificial streams and points.

Such comprehensive environmental risk assessments are expensive, require expert personnel and are not accessible to most local industries, particularly in the "jua kali" sector. These industries should not be left out because, in terms of volume, they could be making a disproportionate contribution to environmental degradation/pollution. There is a need, therefore, to develop central capability within the country to assist existing and new local industries in environmental risk assessment. Fortunately most of these industries use known technologies which do not call for the establishment of sophisticated risk assessment laboratories. There is a need, however, for people with the relevant scientific and technological knowledge. Another need is for these industries to have the ability to have access to and to liaise with relevant laboratories. Further, they should be able to draw on such documents as the European Union Risk Assessment and Regulations and adapt them to the local environment.

(b) Selection of Ingredients

The choice of ingredients also affects the resources required for the manufacture and use of the products.

Therefore, as part of their manufacturing strategy, industries must formulate key environmental criteria for selecting ingredients. But choices are not always easy. Trade-off are sometimes necessary between, for example, energy efficiency and aquatic toxicity. In addition some choices cannot be made solely by scientific methods, but are also subject to public and consumer opinion.

I will use the manufacture of detergents to illustrate some key criteria for ingredients' selection.

Some ingredients that are suitable for use in detergents from the point of view of performance, might have to be excluded from use if judged to be detrimental to the environment. Unilever, for example, has adopted a policy that applies globally that detergents will only be made from the readily biodegradable LAS (Linear Alkyl Benzene Sulphonate), and not BABS (Branched Chain Alkylbenzene). Substances such as alkyl phenol ethoxylates have been put by Unilever on the exclusion list. For some other class of substances, (e.g. dyes and preservatives), instead of an exclusion list, Unilever has drawn up a positive list of substances considered desirable and continuously reviews it.

In ingredient selection the following key criteria can be used:

- Rapid and complete biodegradation
- Low aquatic toxicity
- Low energy consumption
- Low water consumption
- Low waste potential

Again it is necessary to revisit the issue of local industry's capacity to ensure rigorous selection of appropriate ingredients, if industry is to promote compliance with local environmental law. The first point at which to do this is at the environmental risk assessment stage. The Kenya Bureau of Standards, in its role as guardian of product standards should have a list of permitted ingredients or banned ingredients. This list can be incorporated in the various product standards. It can then rely on role of monitoring goods and materials imported into the country can ensure compliance, but with minimum bureaucracy.

(c) Selection Processes/Technology

Choice of technology may have a major impact on the environment. Although there is no firm evidence, technologies/processes which may not be meeting environmental standards of countries of origin could be finding their way into Kenya as second hand

plants. Products which are not good for their country of origin should not be considered good for import into Kenya or any other developing country. This should be established at the environmental risk assessment stage.

Additional investment to comply with environmental regulations needs extra capital and the return on this extra capital is not normally evident to the entrepreneur. To illustrate the point there are over 40 soap manufacturers around the country down to cottage industry ones. How many can afford to treat their soap lyes? - very few indeed. This means the lyes end up in our rivers and sewer systems.

The first step in ensuring compliance is to determine what is happening (an auditing process). The next step is to educate industry and come up with practical solutions which the industrialist will easily buy into. For example in the case of the soap lyes I have referred to, it is not economical to have many small glycerine evaporation/distillation plants. However, the small soap manufacturers can be shown how to produce soap to have lye of high concentration. These lyes should then be sold to the few glycerine evaporation/distillation plants in the country which are currently operating below capacity. The glycerine so produced would be used in personal products and medicines (BP grade) etc.

Another way is to change the technology for making soap. Soap can be made through a process which leaves the glycerine in. This results not only in a better product but also uses less energy hence less environmental impact.

Another step in encouraging industry to comply with environmental laws is to give tax holidays for environment compliance related investments. Some accountants -and many outside the profession - feel that the environmental costs of trade and industry should somehow be reflected in the accounts of businesses and the country. Investment communities are also increasing pressure for businesses to identify environment-related business risks. Change of accounting practice is often slow, and therefore the tax holiday route may be the interim solution.

There are also choices to be made on technologies which are more environmentally friendly. An example is oil refining through physical refining, eliminating the production of acid oil and soapstock, which arises in chemical refining. Unfortunately physical refining becomes economical only at the high volumes. In Kenya there are still a large number of small scale chemical refineries. There is a mind-set that each manufacturer must be vertically integrated to own a refinery. This needs to change. In fact, most value is added after the refining process. The import duty structure in oil refining encourages the import of crude edible oils. Most of the imported refined edible oils would have been produced through physical refining in its country of origin. Apart from saving the country from the polluting impacts of acid oil and soapstock this would also save the country a lot of energy with its accompanying beneficial environmental effects. It is therefore necessary to look critically at import duty structures, their impact on choice of raw materials and technologies and their environmental impact.

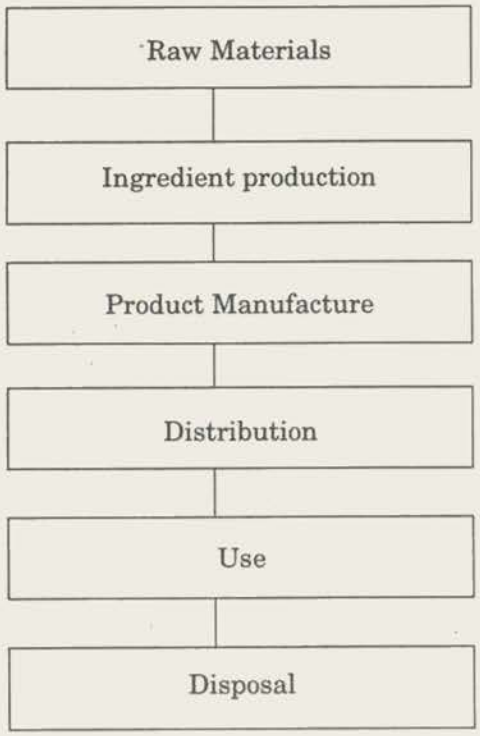
(d) Life Cycle Assessment (LCA)

Some multi-nationals have introduced Life Cycle Assessment systems. This covers assessment from the supply and storage of raw materials through manufacture, whether in-house or third party, to finished product storage, distribution and labelling. It should extend also to disposal of the product.

LCA is an additional tool to reduce the overall environmental impact of a product and of production processes, and to help develop improved products. In simple terms, LCA involves listing positive and negative environmental aspects of a specific product or production process. However, properly conducted, LCA can be both expensive and difficult. Often it is large companies who can rely on it to further their drive to achieve compliance with environmental standards.

Shown diagrammatically the stages of LCA are as follows:

An LCA product study examines stages of the product life cycle, e.g:



For each stage a detailed inventory of inputs

and outputs is made, e.g.

Inputs

> Raw materials, energy, water

Outputs

> Emissions to air, water, land and solid waste

The results can help identify opportunities and guide decisions on best environmental options.

(e) Energy use minimization

The environmental consequences of increased energy consumption, e.g. global warming, are well established. Kenya's energy consumption per capita may be low but we must act now to reduce energy consumption through:

(i) Choosing energy efficient processes e.g. can make soap using 25% or 100% relative energy based on the technology chosen. The same can be said of fabric wash detergents. Consumer habits sometimes dictates how fast technologies evolve.

(ii) Good housekeeping and best practice.

(iii) Recycling.

Each industry should carry out a site energy survey to establish the present position regarding energy use and areas of potential energy cost reduction.

The survey objectives should include the following:

- to identify when and in what form energy is used on site.
- to identify areas in which improvement in energy consumption can be made in the short term with little or no capital investment.
- to identify opportunities for long term improvements in energy consumption which require capital expenditure or expertise.
- to advise on action required to achieve improvement.

The next stage is implementation. Most industries do not have the in-house capacity to carry out and implement the energy survey findings. There is need to build capacity within consulting firms, the Kenya Association of Manufacturers, Ministry of Energy etc. The basis for charging for consulting services should be on a percentage of the auditable savings realized.

(f) Using less ingredients and packaging

Industries should aim to obtain the best performance from the least material input. This can be achieved through a variety of routes: less input of energy; less input of raw materials; use of concentration and multi-factional ingredients (e.g. in detergents manufacture use of percarbonate instead of perborate and carbonate; use of less packaging and transport. Using less raw materials also implies that there will be reduced disposal costs.

For example, technology has shown that most of the total fatty matter (TFM) in soaps is not necessary for an effective wash. Lower TFM soap, depending on technology used and on other ingredients, has been shown to be more effective in cleaning while

minimizing environmental impact. Industry, in conjunction with Kenya Bureau of Standards, should urgently review existing standards to allow use of technologies which give the consumer the desired performance while minimizing material usage.

Regarding packaging, industry should aim to reduce pack weights, introduce refills and educate consumer on concentrates (e.g. high concentrate juices would use less plastic bottles, less transport costs and less outer cases etc).

Plastics are widely used in Kenya and the first step is to minimis the amount of materials used in a pack. Computer Aided Design has been shown to be helpful in doing this.

For industrial applications, bulk or semi-bulk packaging could save a lot of packaging material. Both suppliers and customers are likely to gain some benefit from this while at same time minimizing environmental implications.

Availability of adequate portable water to meet population needs is a challenge which faces many countries. Allow me then to mention that industries should aim to use less water in their manufacturing processes. Industries should look at their water cycle in situations where water from one process can be used for other processes. There should be deliberate effort to re-cycle waste water and re-use condensates. Again the issue of how to raise the initial capital cost comes in and we must find ways of encouraging industries to save and conserve the country's total water resources.

(g) Recycled Packaging Materials

Before discussing the issue of re-cycling packaging materials, I would like to reflect on role of packaging. Packaging has the role of preserving and protecting the product. It is also used by printing information on it to inform the consumer how to use the product and the product's functions. It provides convenience and is essential for the efficient and safe distribution of goods from producers to consumers, saving energy, time and labour. Despite these good points, packaging has increasingly come under focus as an environmental hazard in Kenya and worldwide. Kenyans see the polythene bags causing litter around. This is compounded by garbage collection shortcomings, leading them to wish that someone would do something about it. Industries, while asking local authorities to do more on refuse collection, need also to respond through the 3R strategy - Reduce, Re-use and Re-cycle. The first two I have referred to earlier.

A significant proportion of used packaging can be recycled and industry should take recyclability into account in the design of packaging. Local packaging industries should build into their processes the capability to use re-cycled materials. There is need for the commitment of both the supplier and customer to make recycling effective. The savings and reduction on impact on the environment can be considerable. To illustrate this, in Japan, the Unilever leading detergent powder is made from 100% recycled board. In the US, Unilever made a commitment in 1990 to use 4500 tones of re-cycled plastics every year. Today between 65 - 70% of plastic bottles used by Unilever in US for household products contain between 25 -35% post consumer re-cycled material. To achieve this in Kenya there is an urgent need to develop the necessary infrastructure and capability for the collection and recycling of used packaging. Reflecting on the infrastructure and the way in which consumers are spread across the country, this will not be an easy task.

Products use particular channels to reach the consumers and there is a need to develop reverse channels for collection and recycling materials. The main hurdle is the cost of setting up the infrastructure to collect the materials and finding markets for recycled material. One way would be to require packaging industries to incorporate a percentage of re-cycled material where practicable. The recycled material should be supplied from re-cycled material reprocessing industries rather than requiring each packaging converter to build recycling processing capability. To facilitate sorting, all packaging should be imprinted with an indication of the material it is made of e.g. paper/pe, PP, LDPE etc.

One recent development in Kenya worth noting is the setting up of the Kenya Institute of Packaging. This is a group of knowledgeable people from industry, as well

as other interested individuals with a vision to address issues of packaging standards and educating consumers on responsible use and disposal of packaging, and who are concerned about their environmental responsibilities. The Institute is still in its infancy; it is not funded by industry but, with the right financial resources, I see it as viable and as an effective vehicle in promoting industry compliance with environmental law and building more consumer awareness and responsibility. For example they are planning to hold a one day Seminar on Safe and Environmentally Acceptable Packaging with the main topics as packaging; environment related packaging issues; legislation; and LCA and environmental profiles.

These themes will go far in encouraging a recycling culture in business and society generally. Financing and setting up the infrastructure to encourage re-cycling is a challenge which we should take up.

(h) Environmental Management System and Strategy

Each company in addition to having business strategy should have a clear environmental strategy. I have reproduced verbatim the Unilever Detergents Environmental Strategy as an example of what could be included in the strategy. The responsibility of implementation of the strategy rests with Chief Executive although the day-to-day operation could be delegated to a Board member.

Examples of Environmental Strategy

(i) Products, Processes and Manufacturing

- We aim to improve the environmental quality of our products and operations while continuing to provide high standards of performance.
- We guide our research programmes by using tools such as Risk Assessment and Life Cycle Assessment to develop new products based on ingredients and packaging which will lead to further reductions in environmental impact throughout the product life cycle.
- We aim to minimis the consumption of materials and energy necessary for a specific result throughout the product life cycle.
- We prohibit the use of certain materials in our products.
- We subject materials and processes to explicit safety clearance procedures.
- We monitor and audit our operations to define and deliver environmental improvements.

(ii) Packaging

- We minimis the consumption of packaging materials.
- In line with consumer acceptance we aim to concentrate our products eg, by maximizing bulk density of powders so we can save on packaging and transport.

(iii) Usage

- We use appropriate communication tools eg, on pack, product demonstrations, leaflets etc to inform consumers how best to use our products, to guide the amount used, and where relevant the wash temperature.
- We train our industrial and institutional customers to use our products appropriately.
- We monitor consumer habits and needs by detailed surveys on a global basis.

(iii) Co-operation

- We monitor and maintain awareness of the global environmental agendas of society, competitors, scientists and environmentalists.
- We use this knowledge to help guide the initiatives we take to introduce changes in products and operations.
- We foster dialogue with government agencies, public interest groups, educational organizations, industry bodies,

business partners and customers. We share our know-how with these groups in the interest of achieving real environmental improvements.

(iv) Management controls

- We aim to exercise the same concern for the environment wherever we operate.
- We apply more stringent criteria than those required by law when we believe this to be appropriate.
- We control environmental progress through the normal business planning procedures, setting targets for improvement.
- We encourage suppliers and third party operators to share our environment commitments.
- We are committed to report upon our environmental performance.

(v) Employee involvement

- In order to achieve continuous environmental improvement, we aim to ensure that this strategy is understood by our managers and staff.

(vi) Strategy Summary

- We aim to improve the environment quality of our products and operations while continuing to provide high standards of performance.
- We aim to minimis the consumption of materials and energy.
- We subject materials and processes to explicit safety clearance procedures.
- We foster dialogue and share know-how in the interest of real environmental improvements.
- We aim to ensure that our managers and staff understand this strategy.

(i) Partnerships for the environment

Far more can be achieved in co-operation with other parties in society and in industry than working in isolation. This should involve listening to industry's partners and stakeholders who are also concerned with environment, and sharing knowledge and expertise. It is through such co-operation that faster environmental improvements and cost-effective compliance can be achieved.

Among the stakeholders are suppliers, consumers, local communities, regulatory authorities, academic and scientific organizations.

(i) Suppliers

The suppliers should form a critical partnership with industry if industry is to meet environmental compliance competitively. Industry has to set standards for suppliers to ensure the safety and quality of the material they supply. Where improvements are needed, the company and supplier should pool their joint expertise to develop new ingredients or processes.

(ii) Customers and Consumers

A company can make improvement on environmental performance through changes in materials, formulation and processes but the way in which the products are used and disposed of could have a major impact. It is therefore important that customers and consumers have easy access to clear information on how to use and dispose of the product or packaging. This can be done through clear instructions on the packaging or by having telephone advice lines and so on. The effectiveness of this should be assessed regularly from consumer research.

(iii) Local communities and authorities

Industry is part of the immediate environment where it is sited and how it handles the many issues which affect the local environment and communities will build or destroy its image as a good corporate citizen.

Examples abound where industry and local authorities co-operate to address environmental issues. For example in France there is an integrated national

scheme to collect and enhance the value of packaging waste. In Kenya we need to build stronger bonds between local authorities and industry with the immediate challenge for local authorities being to build capacity and the capability to collect garbage. Sorting waste by type would be the next stage in ensuring better environmental performance. Identification of users of recycled or waste material is one area in which local authorities and industry can co-operate. I will use a simple example. There are some Jua Kali garages in Nairobi along the river which pollute the river with mineral oil. Methods of collecting this oil could be incorporated in fuel oils production by industry. One way would be for an oil company to provide a market and instal a simple filtering facility to remove metals and sludge before blending the oil into fuel oil.

(iv) Academic and Scientific Organization

The growth of best practice in environmental management will be assisted by the development of specialist scientific resources. I am glad to note that environmental studies have been incorporated in the University education curriculum. Close co-operation with Universities either by defining projects for environmental studies students or on a consultancy basis would help industry solve those nagging environmental issues. The academic community could build capacity to assist industry in environmental risk assessment and life cycle assessment referred to earlier.

(j) Audit and environmental performance reporting

I started by highlighting environment risk assessment as an important plank in promoting industry's role in compliance with environmental laws. Environmental self-auditing and occasional auditing by a third party to evaluate the quality of manufacturing operations is another important plank. Where a company is part of a multi-national company, the third party audit is done by trained environmental auditors on a, for example, 3-year cycle. I would recommend we build this capability as most industries in this country do not have the in-house expertise. However the approach should not be that of an "auditor" - blame and prosecute the first time a problem is detected - but that of a "facilitator" to improve the work environment at the particular industry and the country at large. Use of bodies the industry already have confidence in like Kenya Association of Manufacturers - would make the task much easier and industry would quickly buy-in to the idea.

The audit should have four objectives:

- to assess compliance with natural resources legislation.
- to facilitate comparison and interchange of "best practice" between industries.
- to identify key areas of environmental risk.
- to evaluate training programmes and compile data to assist in environmental management training.

In order to assess progress in environmental performance, improvement and compliance, it is very important that companies measure the inputs and outputs from their manufacturing sites.

(k) Training

Training is important to bring environmental considerations into daily business operations. Industry should aim at equipping all staff with the necessary understanding, knowledge and skills in operational safety and health and in environmental matters.

Companies need to build into their training calendars training on safety, health and environment. Formulation of policy on these areas with full support of the Chief Executive is important. Therefore sensitization and training of Chief Executives and senior personnel from industry on environment issues is very important in getting industry's commitment to meeting environmental laws in Kenya.

3. CONCLUSION

In conclusion, I see industry as having an important role to play in conjunction with other stakeholders e.g. consumers and government. Industry's cooperation is the bottom-line of ensuring compliance with environment laws in Kenya. I also see industrialization and social and environmental responsibility as not in conflict but as complimentary. I see a need for capacity building in various aspects of environmental management and if there was choice in enforcing environmental laws between the stick and the carrot, in the early stages I would err on using the carrot backed by education and sensitization on environmental sustainability and responsibility.

THE ROLE OF BANKERS IN THE PROMOTION OF COMPLIANCE WITH ENVIRONMENTAL LAW BY INDUSTRIES

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PREAMBLE

One of the indisputable lessons learnt throughout the history of human development or existence is the fact that there can be no greater force than an idea whose time has come. The inextricable symbiotic relationship between rational economic development and sustainable use of the environment (read as the totality of nature and natural resources including the cultural heritage and human infrastructure essential for socio-economic activities) can no longer be regarded as an arguable or debatable proposition or hypothesis as was the case in the early 70s when A. R. Kasdan published his outstanding seminal treatise entitled: *Third World War: Environment versus Development* as a way of influencing the direction of international thinking on the subject. Indeed, as observed during the Earth Summit in Rio de Janeiro in 1992:

> **"Economic conditions, both domestic and international, that encourage free trade and access to markets will help make economic growth [development] and environmental protection mutually supportive for all countries, particularly for developing countries and countries undergoing the process of transition to market economies; economies which are essentially characterized by economic growth, social development and poverty eradication as the first and overriding priorities".**

Given the imperative nature of this fact, bankers as key players and stakeholders in the process of economic development are expected to, and indeed must, play a critical and pivotal role in the promotion of compliance with environmental laws and regulations by industries.

1. INTRODUCTION

Although the theme of this workshop is continent-wide in scope, for practical considerations, I shall limit my presentation to the Kenyan situation, which will be used as an illustration. Being creatures of habit, allow me also to make a cautionary statement up-front about possible personal biases originating from my professional/occupational background which will be evident during the course of this presentation.

As a prelude to my presentation I propose briefly to outline the role of banking in economic development and thereafter examine why Bankers should have responsibility, or in journalistic parlance, accept a "gate-keeper" role; in legal terms, accept to be "surrogate regulators" in promoting compliance with environmental laws and regulations. The exposition will then:

(i) explore possible implementation mechanisms to facilitate the discharge of the expected responsibility;

(ii) opine on an appropriate legal/fiscal framework that would facilitate such a role;

(iii) examine the possible effect of environmental liability on banker/industry relationship;

(iv) comment on the possible scope and limitation of lender liability for environmental injuries and/or damage;

(v) make certain suggestions on an environmental insurance / restoration fund;

(vi) draw conclusions which incorporate certain recommendations.

2. THE ROLE OF BANKING IN ECONOMIC DEVELOPMENT

It may be of interest to observe that there is no agreed definition of the term "banker". However, the meaning of the term may be derived from examining what constitutes banking business or other analogous activities.

As we are all aware, the traditional role of banking is related to financial intermediation by facilitating the creation of a meeting point in the market place for savers and those in need of loan funds for development purposes. Thus, as defined in the Banking Act (Cap.488 of the Laws of Kenya), the terms "Bank" and "Financial Institutions" and the related activities of "banking business" and "financial business" respectively, imply the fundamental role of mobilizing deposits from members of the public and employing such deposits by way of loans, investment, or in any manner for the account, and at the risk, of the person so employing the money and who by definition can therefore be referred to as a "banker".

Technical definitions apart, for purposes of this presentation let us agree to apply the term banker to any person who by dint of business activity mobilizes deposits and lends on such deposits. This practical definition will therefore cover the **53** commercial banks, **17** non-banking financial institutions, **4** building societies and **2** mortgage finance companies presently operating in Kenya. By the same token, let us also agree to extend this definition to include the 38 insurance companies and approximately **3250** savings and credit co-operative societies (both formal and informal) which are also critical players in financial intermediation.

As will be observed from **Appendix I** (Banking Sector Global Balance Sheet Analysis), 52% of the total assets of the sector as at December 31, 1996 were invested in loans and advances. Of these an average of **20.4** % were channeled to the industrial sector during the period August 1996 - August 1997 (Source: Central Bank of Kenya: Monthly Economic Review October, 1997). Global Profit and Loss Analysis for the period ending December 31, 1996 reveals that 63% of the sector's income was derived from interest on the loans and advances (**Appendix II**).

Besides direct availing of credit, as part of their portfolio diversification, bankers may also make direct equity investments in industry either through the Nairobi Stock Exchange or directly in non-listed companies in the industrial sector. As a matter of fact, by virtue of section 12(b) of the Banking Act, such equity investments are limited in aggregate to 25% of an institution's (banker's) capital and unimpaired reserves. In this instance, one would be concerned with, among other things, the level of returns on the equity investments as well as the continued state of health of the relevant industry. Thus, in this presentation, the terms "credit availing" and "equity investments" will be treated as financial exposures to the industrial sector, and applied inter-changeable.

As will be observed from Appendix III (Growth of Gross Domestic Product (GDP) 1991 - 95), GDP contribution by the industrial and financial services sectors showed a steady and significant growth trend, with the two sectors contributing 19.4 % and 22.6 % of GDP respectively during 1994-95 (expressed in terms of current prices). For purposes of clarity, the GDP growth trend is illustrated in the graphs incorporated in **Appendix III(a)** and **Appendix III(b)**.

From the statistical evidence alluded to above, it can therefore be surmised that the state of health of industries have a substantial direct bearing on the state of health of the banking sector and the economy in general.

3. WHY BANKERS SHOULD BE CONCERNED WITH ENVIRONMENTAL ISSUES

In the preceding section, an attempt has been made to demonstrate the correlation between the banking and the industrial sectors within the context of the role of banking in economic development.

Under this section, I now propose to examine why bankers should have responsibility for promoting compliance by industry with environmental law and regulations. As a starting point, I propose to cite a few examples of celebrated global environmental issues and disasters that have had, and continue to have, remarkable impact on the thinking on the subject

of responsibility for ensuring compliance with environmental laws and regulations. The issues are as tabulated below:

Global Disasters	Form of Pollution
The Bhopal Disaster in India	air
Movement for the Survival of Ogoni People (MOSOP) - the Saro-Wiwa and the Ogoni People debacle.	soil, water & air
Toxic waste dumping in Nigeria	soil and water
Forest fires (Indonesian smog)	air (Global Warming)

At national level, there has been an increasing spate of complaints arising out of some of the following industrial and commercial activities:

Industrial / Commercial Activity	Form of Pollution
Extractive Industries e.g. mining	soil, water & air
Paper Processing	air & water
Food Processing	soil, water & air
Sugar Processing	soil, water & air
Use of Agro-chemicals	soil, water & air
Increasing Demand for Consumer Products (aerosols, fridge & form plastics)	air (Ozone Layer Depletion)

The examples cited above would have to be further examined within the overall context of global climate change. The recent massive landslides experienced in Chania Valley of Tetu Division, Nyeri District, and Mathioya in Muranga District, are consequences of indiscriminate felling of trees and poor farming management practices in areas which had been gazetted as forest lands, thanks to the catalytic effect of the El Nino phenomenon.

To my mind, there are three basic reasons why Bankers should have responsibility for promoting compliance with environmental law and regulations, a responsibility which should be essentially perceived as participation in risk management in this vital area. The reasons may be summarized under the following rubrics:

3.1. Self-Serving Non-Altruistic Reasons:

(a) **Balance Sheet factors**: A project may run into problems as a consequence of environmental liabilities. This may have a negative impact on a borrower's cash flows which may result in delayed payments or write-offs of interest and principal. Such a situation may ultimately have negative impact on the bank's asset quality and earnings (profitability). Other negative exposures may relate to positional risks in respect of possible diminution in the value of securities held. In certain cases, funding risks may be experienced by way of possible reduced access to and increased costs of capital from international markets especially in internationally syndicated loans.

(b) Ensuring continued existence of systemic stability in the overall financial system i.e.

protection of the "goose that lays the golden egg".

3.2. Corporate Social Responsibility

This relates mainly to moral obligation to discharge the responsibility by virtue of the need to observe the universal seven cardinal principles that have influenced the thinking and formulation of environmental laws worldwide. The stated principles may be exemplified by the doctrine of national patrimony or inter-generational justice or equity which essentially espouses Principle 4 of the Rio Declaration on Environment and Development viz. "the right to development must be fulfilled so as to equitably meet the developmental needs and environmental needs of the present and future generations". These are global responsibilities, the fulfillment of which bankers are expected to play their due role as corporate members of the world community.

3.3 Globalization and Integration of Markets

The growing trend for strict adherence to agreed international standards with respect to product quality, production processes, packaging, labelling etc. (through for instance GATT, UNCTAD, COMESA, SADC, PTA, IGADD, EAC and EEC Treaties), requires that bankers should be in the front line in encouraging investors borrowing money to embrace such global concepts as Total Quality Management (TQM) under ISO 9000 series, European Union Eco-Management and Audit Scheme (EMAS), Environmental Management Systems (EMS) for commerce and industry under ISO 14000 series which are essentially based on British and American standards.

3.4. Legal Responsibilities

The legal responsibilities that could compel bankers to ensure compliance may be grouped under the following headings:

(i) Civil / Tortious Liabilities Under the Common Law Principle of General Duty to Take Care.

The underlying concepts may be exemplified by principal/agency relationship, vicarious liability, etc. Situations under which a duty to take care can arise are multifarious and for our purposes one may be persuaded to adopt the following dictum of Lord Atkin in the celebrated English case of Donoghue v. Stevenson [1932] A.C. 562, H.L. at page 580 which states that:

> **The rule that you are to love your neighbour becomes in law, "you must not injure your neighbour"; and the lawyer's [industrialist's] question of " Who is my neighbour?" receives a restricted reply. You must take reasonable care to avoid acts or omissions which you can reasonably foresee would be likely to injure your neighbour. Who, then, in law is my neighbour? The answer *seems to be: persons who are so closely and directly affected by my act that I ought reasonably to have them in contemplation as being so affected when I am directing my mind to the acts or omissions which are called in question."* [Emphasis supplied]**

(ii) Lender Liabilities arising out of Superfund or restoration fund related legislation

This relates to:

- Statutory/criminal sanctions such as penalties and fines.
- Compensation claims related to contaminated sites including cost recovery actions and clean-up costs.

A cursory review of the above reasons will lead to the inescapable conclusion that bankers not only have, and share in, the responsibility of promoting compliance by industry with environmental laws and regulations. It is emphasized that in discharging this onerous responsibility bankers have to be competent partners in dialogue with the other stakeholders in articulating their positions in what essentially is a collaborative effort.

4. POSSIBLE IMPLEMENTATION MECHANISMS TO FACILITATE THE DISCHARGE OF THE EXPECTED RESPONSIBILITY

One sees possible implementation mechanisms at two levels. The first level mechanism relates to implementation methods that the banking sector can devise and implement at sectoral level

while the second level mechanism relates to implementation methods that bankers can undertake at individual corporate level.

4.1. First level implementation mechanisms

(i) The formulation and adoption of an appropriate sectoral code of ethics and conduct or "Responsible Financing Programme" that focuses appropriately on environmental matters with particular emphasis on availing credit to industry. This could possibly be modelled on the European chemical industry's "Responsible Care Programme."

(ii) The formulation and adoption of credit appraisal systems and techniques as well as loan administration procedures that encompasses Environmental Impact Assessment (EIA), Environmental Risk Assessment (ERA), and Environmental Due Diligence and Audit as integral parts of project feasibility study and implementation. This would demonstrate an awareness of environmental issues.

(iii) The formulation and adoption of accounting standards and disclosure requirements that would recognize appropriately materially significant environment - related liabilities.

(iv) In conjunction with the other stakeholders:

- assisting in the creation of an enabling legislative/fiscal framework that shows sensitivity to environmental matters by, for instance, ensuring the establishment of a legally effective Environmental Protection Authority;
- assist in the establishment of an environmental restoration fund;
- assist in the establishment of centralized professional competencies in such fields as EIA and ERA;
- assist generally in sensitization of the public and the enhancement of public awareness on environmental management matters;
- offering support for independent private sector development of environmental management consultancy.

4.2. Second level implementation mechanisms

These include:

(i) The development of internal professional competencies in such fields as EIA and ERA.

(ii) The formulation and adoption of credit appraisal systems and loan administration procedures that recognize and appropriately reward projects that show sensitivity to environmental matters. Such rewards would be reflected, *inter alia*, in the costing/pricing of the underlying entrepreneurial risks expressed in terms of the interest rates and the other related transaction costs charged.

(iii) Insistence on EIA, ERA, Environmental Due Diligence/Audit as a pre-requisite to initiating and subsequently sustaining loan relationships.

(iv) Use of legal documentation with appropriate protective covenants on Environmental Risk Management.

5. SUGGESTED LEGAL/FISCAL FRAMEWORK

Although the Government of Kenya has explicitly accepted Agenda 21 (Rio de Janeiro Declaration)as part of the National Environmental Policy by appropriate incorporation in the country's National Development Plans, it must be mentioned that at the operational level, the legal landscape is currently characterized by fragmented sectoral laws covering approximately 33 statutes that are of a distinctive environmental character. [**Appendix IV**].

Prof. Okidi notes in his article on International Perspectives on the Environment and Constitutions published in *The South African Journal of Environmental Law and Policy, Volume 3 No.1, March* 1996, that when it comes to establishing an appropriate legal and institutional regime for environmental law, it is a matter of principle that there must be a complete array of normative provisions as well as institutional and procedural arrangements for the enforcement of the universal principles governing environmental legislation. These principles may be summarized as follows;

(i) *Sustainable utilization*: The principle restates the doctrine of inter-generational justice or equity in the use of the environment and natural resources.

(ii) *Precautionary measures*: The principle requires that every precaution and prudence should be exercised to prevent any possible deleterious environmental consequences of any socio-economic activities. Such measures would include EIA, ERA, Environmental Audit and Environmental Monitoring.

iii) *Integration of Environmental Considerations into Development Planning and Management.*

(iv) *The promotion of Public Participation in Environmental Decision-Making*

(v) *The Polluter Pays Principle*

(vi) *Prior Consultation and Cooperation*

(vii) *Provision of Legal and Institutional Framework*: This is a baseline principle which stipulates that when environmental laws have been made there must be legal authority and the institutional machinery for their enforcement.

It is in this regard that I believe that based on the experience gained from other common law jurisdictions such as U.S.A., Australia, New Zealand, Canada and U.K., the proposals regarding reform of environmental law in Kenya contained in the Report of the Environmental Offenses Committee of the Task Force on the Reform of Penal Laws and Procedures which will be debated during the Eighth Parliament (1998 - 2002), if adopted, will provide the initial stepping stone for comprehensive environmental legislation in Kenya. In essence, the Report recommends a framework statute, i.e., a centralized legislated system of environmental management which provides the mechanisms of administrative regulation as well as criminal sanctions. The proposed framework legislation puts in place the vital machinery of environmental standards setting, which besides, will have the capacity to control the beneficial use of the environment, through mechanisms such as environmental impact assessment and the licensing of projects. The controlling agency (Environmental Management Authority), created by the proposed statute, will be in a position to comply with its lawful orders or the terms of its licenses. The Report also advocates retention of sectoral statutes provided that the operative standards and the scheme of enforcement of the statutes are to be harmonized with the framework statute.

It is further noted that the proposed legislative framework will combine the following three key elements;

(i) A command -and- control regulation system;

(ii) Self regulation;

(iii) Market driven incentives/instruments:

- Tax waivers/exemption.
- Favourable import duties.

Constitutional Framework: Although it is debatable whether constitutional entrenchment may be the right basis to gauge the degree of importance that a country attaches to environmental matters, given the over-riding nature of constitutional provisions, a case can be made for such entrenchment. Within the African context, Equatorial Guinea, Ethiopia, Uganda, Malawi and South Africa have clearly led the way in their path-breaking initiatives to include such entrenchment provisions. Of the five jurisdictions, the South African provisions have been found to be the most appealing. Section 24 of the South African Constitution stipulates as follows:

"Everyone has the right :-

a) to an environment that is not harmful to their health or well-being; and

b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:-

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Besides legal hierarchal superiority, such constitutional entrenchment would give the desired visibility to environmental matters and thereby assist in enhancing the level of public awareness about the critical importance of en-

vironmental matters. In addition, by constitutionally placing individuals at the center of environmental management, entrenchment would redress the current impediment imposed in the development of case law through the [mis] application of the common law principle of locus standi which technically limits prosecution on environmental matters to the AG and restricts the scope of individuals successfully to sue on environmental matters only to situations where the individual can demonstrate exemplary injuries in matters of public nuisance or injuries to personal or proprietary interest. [Cases such as Wangari Mathai on Uhuru Park and Lawrence Nginyo Kariuki on Kamiti Forest may illustrate the concerns].

In my view, circuitous stipulations via the Bill of Rights Provisions on such a grave matter, as is presently the case in Kenya, will not suffice. A case can therefore be made for constitutional amendment on this issue through the initiatives currently being taken in the Constitution of Kenya Review Commission Bill.

6. POSSIBLE EFFECTS OF ENVIRONMENTAL LIABILITY ON BANKER/INDUSTRY RELATIONSHIP

As a consequence of the potential liabilities in the banker/industry relationship, depending on how it is managed, there could be considerable strain in the relationship. To avoid this, one would advocate informed dialogue or partnership with all the other stakeholders including industry so as to create business practices or systems which are anchored on a foundation that shows appropriate sensitivity to environmental matters.

7. POSSIBLE SCOPE AND LIMITATION OF LENDER LIABILITY FOR ENVIRONMENTAL INJURIES AND/OR DAMAGES

As evidenced by the experience from the USA, lender liability should not, on policy grounds, be left open-ended. Otherwise chaos would reign and the scarce resources which should have otherwise been utilized in improving the management of the environment would be misdirected into such transaction costs as legal fees, investigation fees and so on. In my view, there are three effective ways of limiting lender liability for environmental injuries and damages. These are :

(i) Incorporation of appropriate and satisfactory defenses and exemptions for secured lenders;

(ii) Judicious application of the "public welfare offence" doctrine to avoid creating strict criminal liability for environmental regulations violations;

(iii) Devising compensation schemes based on a pre-determined statutory scale.

7.1 Statutory defenses/exemptions for secured lenders

A review of the legal regimes of other common law jurisdictions reveals that the doctrine of environmental lender liability has evolved through extended liability approach. Under this approach, both the regulatory authorities and judicial authorities can interpret the applicable legislation as extending to bankers (ie lenders) although bankers may not explicitly be the primary targets of the legislation. Lender liability is therefore an important, but essentially residual, aspect of the litigation driven, court-mediated model for securing environmental clean-up and the allocation of associated costs that is currently dominant in western economies. The concept addresses those situations where a secured creditor would be made liable for its debtor's (borrower's) obligations to third parties. The notions are essentially judge-made or common law concepts. It is in this sense that such common law principles as vicarious liability, principal/agency relationship, product liability and so on are often invoked to provide the underlying juridical rationale.

In practice, as observed by Kwame Mfodwo, bankers can attract liability when they play any of the roles of investigator, profit sharer, manager, adviser, shadow director, security enforcer, receiver, receiver's appointor or indemnifier. Thus, situations giving rise to possible liability may be exemplified by, *inter alia*, the following:

- Lending to a project or a borrower who subsequently becomes environmentally liable to a significant degree;

- Being *de facto* or *de jure* in control of an undertaking which subsequently becomes environmentally liable to a significant degree;

- Foreclosing on a mortgage and thereafter discovering that the property has environmental problems;

- Being the potential owner of an environmentally hazardous property in that the banker has the right to realize the security previously offered by a now financially troubled client - but finds that the security is environmentally encumbered;

- Providing guarantees or sureties for firms with potential or actual environmental liability e.g. firms which produce or handle hazardous waste or firms which clean-up hazardous waste or provide advice on such matters.

Lenders would therefore legitimately be concerned about their relationship to polluting activities, to land on which polluting activities take place or have taken place and with enterprises engaged in polluting activity.

Given the mistaken, but prevalent, wrong perception that bankers are richer, or have "deeper pockets", than most of the potentially liable parties (PLPs), and therefore constitute, in the eyes of environment protection authorities, good targets when it comes to recovering costs of extensive clean-up of contaminated sites, it would be necessary in the Kenyan context for lenders vigorously to advocate for appropriate statutory defenses or exemptions that would recognize the function of lending in the normal course of business as a facilitative and independent activity which should not attract serious consequential third party liabilities. The following exemption from liability clause modelled after the Australian Bankers Association Proposal for inclusion in Federal and State legislation would provide a reasonable starting point:

"A Financial Institution shall not incur any liability under this Act, by reason that:

(a) it makes a loan or otherwise provides or continues to provide financial accommodation to any party or parties in the ordinary course of its business, or

(b) pursuant to a financial arrangement with another party or parties it holds indicia of title or is the nominal legal owner of any property, or

(c) it: (i) forecloses upon; or

(ii) appoints a receiver or receiver and manager or agent for mortgagee in possession over; or enters into possession of; or otherwise deals with;

(iii) land or any other property for the purpose of protecting, enforcing or realizing upon any security or;

(iv) otherwise deals with; land or any other property for the purpose of protecting, enforcing or realizing upon any security, or

(d) it provides financial advice to any person or persons or otherwise carries out any bona fide activities to monitor or manage a loan or other financial accommodation".

Such a statutory provision would, in my view, provide the desired well-defined, flexible and equitable exemption from environmental liability for lenders, a feature lacking in most jurisdictions where management of Superfund-related cases have proved inequitable for lenders.

7.2 Judicious application of the "public welfare offense" doctrine

It is an accepted principle in criminal jurisprudence that criminal conviction can only be sustained if the element of *mens rea*, or criminal intent or the requisite mental state, is established. The criminal offenses related to environmental management are usually drafted in such a manner that the stated criminal intent is made a critical ingredient. It is for this reason that phrases such as "Any person who knowingly, recklessly, or negligently ... shall be guilty of an offence", generously appear in legislation on offenses which may be regarded as dealing with injury to public welfare in general.

In recent court decisions, the USA jurisdiction has set a trend in invoking the "public welfare offense" doctrine which creates an exception to the established criminal law requirement of mens rea in the enforcement of regulatory offenses. This has resulted in a judicially created strict liability for environmental regulatory violations. Such decisions are exemplified by the Ninth Circuit Court of Appeal decision in the Weitzenhoff's case where the court refused to instruct the jury on the defendants' proposed affirmative defence that they did not know that their actions violated the National Pollution Discharge Elimination System permit. The court proceeded to sustain the felony convictions for violations of the Clean Water Act which provides that anyone who knowingly violates certain sections of the Act or any permit condition or limitation implementing any such section is guilty of a felony.

In Kelly v. United States Environmental Protection Agency [No. 92 - 1312 (DC Cir. 1992)], the United States Court of Appeals for the District of Columbia rejected the regulation designed by the Environmental Protection Agency (EPA) to shield lenders from environmental liability through promulgation of the Lender Liability Rule. The court held that EPA lacked the authority to issue the promulgation because only Congress could define the respective liabilities of the parties under the Superfund legislation and that only courts could interpret the liabilities of given parties. The court therefore vacated the Lender Liability Rule leaving lenders to be guided by the earlier ruling in United States v. Fleet Factors, 901 F.2d 1550 (11th. cir, 1990), which established the principle that a lender with unexercised capacity to influence its borrower's waste disposal practices could be held liable for the cost of cleaning up its borrower's property. Thus, as observed by Edward B Witte and Mark L. Prager in their article on Environmental Lender Liability: Searching for Safe Harbors in the Wake of Kelly v. EPA published in *Wisconsin Environmental Law Journal Vol. 1 No. 1.* and Kepten D. Carmichael in the article Strict Criminal Liability for Environmental Violations: A Need for Judicial Restraint published in the *Indiana Law Journal Vol. 71: 729,* considerable judicial restraint would be needed in the development of appropriate case law.

7.3 Devising Compensation Schemes based on a Pre-determined Statutory Scale

As mentioned above, there is a general mis-perception that of the PLPs, lenders are richer or have deeper pockets than most PLPs. Indeed, in the Kenyan situation there is a firmly held, although mistaken, belief that banks and stakeholders such as industrialists have unlimited resources. It is quite often forgotten that as a business enterprise, when confronted with additional costs in doing business (and the range of compensation we are alluding to here would constitute such costs) banks would invariably pass on such costs to the consumers (ie borrowers). It is therefore strongly advocated that Superfund-related compensation schemes should be anchored on predetermined statutory scales that would incorporate formulae aimed at facilitating granting of realistic and pragmatic compensation awards. Otherwise, as Christopher Wood cautions in his book on *Environmental Impact Assessment - A Comparative Review*, incurring uncontrolled expenses, as is the case in the USA, would have disastrous consequences on the continued viability of managing the regulatory regime. It may also be instructive to recall Larry A Reynolds' observation that for similar and other reasons it has not been possible for Canada to device an effective environmental impairment liability insurance scheme. In addition to these reasons, bankers should be concerned with the following further key policy issues:

(i) application of the principle of retrospective or retroactive liability;

(ii) apportionment of liability in respect of historically contaminated sites in view of the fact that such liabilities are supposed to be joint and several and such sites would frequently have multi-party character in terms of causation;

(iii) limitation periods.

8. ESTABLISHEMTN OF AN ENVIRONMENTAL INSURANCE RESTORATION FUND

To my mind, some of the key issues to be addressed on the establishment of an environmental trust or restoration fund would be related to the funding arrangements and the responsibilities to be discharged by such a fund.

For purposes of comparison, in the USA jurisdiction, The Comprehensive Environmental Response Compensation and Liability Act ("Superfund" or "CERCLA") constitutes the necessary medium for funding environmental restoration. The Act establishes liability for classes of parties who are associated with contaminated sites. In Superfund terms the following are the four classes of potentially responsible parties (PRPs):

(i) any person who currently owns or operates a property contaminated by hazardous substances (a "current owner" or "current operator");

(ii) any person who owned or operated a property presently contaminated with hazardous substances at the time the hazardous substances were disposed of (a "prior owner" or "prior operator");

(iii) any person who arranged for disposal of hazardous substances which are later identified at a contaminated site (a "generator");

(iv) any person who transports hazardous sub-

stances to any site which is later found to be contaminated with the same hazardous substance (a "transporter").

Courts in the USA have endorsed the aggressive interpretation of these categories by the EPA and other private third party plaintiffs to cast a broad net of liability on a wide array of business and individuals. Most disturbingly for lenders, the term "owner" or "operator" has also been liberally construed potentially to include parties who take security interest in property which is found to be contaminated.

The Superfund PRPs are responsible for all costs of "removal or remedial" actions (also known as "response costs") to investigate and clean-up a "release" of a "hazardous substance" from a "facility". Superfund also provides private parties who investigate and clean-up contaminated sites in a manner consistent with the EPA's national contingency plan with a private right of action against other PRPs, known as a Cost Recovery Action, and also a right of contribution against other PRPs.

In the Kenyan context, one is persuaded to support the proposals contained in the Framework Legislation: *The Environmental Management and Coordination Bill* which suggests the establishment of a separate environmental trust fund and environmental restoration fund, both possibly modelled after the Superfund. The main object of environmental trust fund is to facilitate and maintain rational management of the environment and natural resources by covering project and operational expenses. The funding would be obtained from the following sources:

(i) appropriations by the National Assembly for the purposes of the trust fund;

(ii) donations, endowments, grants and gifts from whatever source and specifically designated for the trust fund;

(iii) such sums or other assets as may be donated to the trust fund.

On the other hand, the object of the environmental restoration fund would be a supplementary insurance for the mitigation of environmental degradation where the perpetrator is not identifiable or where the exceptional circumstances require the Environmental Management Authority (Authority) to intervene towards the control or mitigation of environmental degradation.

The funding would be got from:

(i) such proportion of fines, fees, grants as may be determined by the Authority;

(ii) such sums as may be donated or levied from industries and other project proponents as a contribution towards the restoration fund.

As shown above, the sourcing of funds reflects collective responsibility and collaborative effort from an array of stakeholders and the proposal would therefore be acceptable to bankers.

It is also hoped that the insurance industry will develop appropriate environmental impairment liability products to complement the above initiatives.

9. CONCLUSION

This presentation has attempted to demonstrate that, to the extent that there is an inextricable symbiotic relationship between rational economic development and sustainable use of the environment, bankers, as key players and stakeholders in the economic development process, are expected to, and must, play a critical and pivotal role in the promotion of compliance by industry with environmental laws and regulations. Given the worldwide trend in this direction, it my view that it is a role that Kenyan bankers can not afford to ignore.

In view of the various conflicting interests and the general mis-perception that bankers have deeper pockets than the other PLPs, this presentation strongly advocates the need for bankers to be competent dialogue partners in negotiating their position in the discharge of the expected role. Informed partnership is seen as the key to bridging any possible communication gaps on this vital subject that requires collaborative effort all the way round.

An attempt has also been made to identify possible implementation mechanisms that bankers could consider in the discharge of their responsibilities as surrogate regulators. Such mechanisms, at sectoral level, include formulation and adoption of credit appraisal systems and techniques as well as loan administration procedures that encompass a strategic approach to environmental issues by specifically incorporating Environmental Impact Assessment (EIA), Environmental Risk Assessment (ERA) and Environmental Due Diligence and Audit as integral

parts of project feasibility study and implementation.

The existence of an enabling legal and fiscal environment has been identified as a prerequisite to an effective environmental management regime. To this end, a case has been presented for the debate and possible adoption of the *Environmental Management and Coordination Bill* as a framework legislation. A case has also been made for the introduction of an appropriate constitutional entrenched provision so as to elevate the visibility of environmental matters in the public policy arena.

Finally, cognisance has been taken of the fact that as bankers and other stakeholders do not have unlimited resources, compensation and re-mediation schemes to be devised should be governed by realism and pragmatism as to resource limitations.

APPENDIX IV
SECTORAL STATUTES ON ENVIRONMENTAL MANAGEMENT IN KENYA

(i) Agriculture Act (Cap.318);
(ii) Antiquities and Monuments Act (Cap.215);
(iii) Explosives Act (Cap.115);
(iv) Factories Act (Cap.514);
(v) Fertilizers and Animal Foodstuffs Act (Cap.545);
(vi) Fisheries Act (Cap.378);
(vii) Food, Drugs and Chemical Substances Act (Cap.254);
(viii) Forests Act (Cap.385);
(ix) Government Fisheries Protection Act (Cap.379);
(x) Grass Fires Act (Cap.327);
(xi) Kerio Valley Development Authority Act (Cap.441);
(xii) Lake Basin Development Authority Act (Cap.442);
(xiii) Lakes and Rivers Act (Cap.409);
(xiv) Land Planning Act (Cap.303);
(xv) Malaria Prevention Act (Cap.246);
(xvi) Mining Act (Cap.306);
(xvii) Pest Control Products Act (Cap.346);
(xviii) Petroleum (Exploration and Production) Act (Cap.308);
(xix) Plant Protection Act (Cap.324);
(xx) Prevention of Cruelty to Animals Act (Cap.360);
(xxi) Protected Areas Act (Cap.204);
(xxii) Public Health Act (Cap.242);
(xxiii) Radiation Protection Act (Cap.243);
(xxiv) Seeds and Plant Varieties Act (Cap.326);
(xxv) Suppression of Noxious Weeds Act (Cap.325);
(xxvi) Tana and Athi Rivers Development Authority Act (Cap.371);
(xxvii) Town Planning Act (Cap.134);
(xxviii) Trout Act (Cap.380);
(xxix) Use of Poisonous Substances Act (Cap.247);
(xxx) Water Act (Cap.372);
(xxxi) Wildlife (Conservation and Management) Act (Cap.376);
(xxxii) Coast Development Authority Act (Cap.449);

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SUMMARY OF PRINCIPAL THEMES ARISING OUT OF THE DISCUSSION OF PAPERS BY JOHN NTAMBIRWEKI, E. MOUTONDO, AND JONATHAN HANKS ON ENVIRONMENTAL LAW

These papers were mainly aimed at introducing industrialists to key principles of environmental law relevant to industry in Africa.

The issue of the implementation and enforcement of environmental law figured prominently among the questions. The fact that the law is often written in a language which is technical and not always understood by the public was raised. The workshop discussed the issue of how to make the law accessible to the public. Of particular significance was noted the experience of Burkina Faso, where an attempt to simplify the law for easy public consumption has been undertaken. The need to create easy to follow or popular versions of various environmental laws was noted as a basic necessity in most African countries.

Along with the need to popularise the environmental law, it was noted that there was need to generate the general public awareness regarding the environment, the ways it may be degraded and need to conserve it as well as the necessary measures to avoid degradation and restore the environment. Within industry, it was noted that there was need to enhance the training of managers and persons on the shop floor in matters relating to the environment. Of particular significance in this regard are issues relating to the environment in the workplace, conservation of energy, waste minimization and avoidance, and response to emergencies.

The issues relating to the place and appropriateness of environmental law in Africa were raised. Of key interest was the "polluter pays" principle and whether Africa can afford the application of the full extent of the principle. It was noted that while African industry was still struggling to get to its feet, it was necessary at inception to attempt to avoid the possibility of future costly environmental repair. This necessitated the establishment of stricter environmental laws and standards at this stage of our development.

With regard to the "polluter pays" principle, a concern voiced by the workshop was whether the cost of complying with environmental law would not ultimately be passed on to the African consumer through the pricing of goods. It was the view of many at the workshop, that society has to bear the burdens of cleaning up and maintaining the environment. However, it was also noted that cleaning up the environment was also ultimately the reduction of costs to industry by optimal use of resources and minimization of wastes. More importantly, observance of the law is also an insurance against unforeseen future litigation and associated costs.

The issue of the application of environmental law to the informal sector was raised and discussed. It was noted that the informal sector was a very important source of environmental pollution. It was also noted that in many African Countries the informal sector applies in the grey zone between the lawful and the outrightly illegal. It was, however, noted that the informal sector was a key sector for African progress. It was a potential centre of innovation and collectively a large employer. The question was how the benefits of environmental law could be made known to the sector and how compliance could be promoted. One of the avenues suggested was that environmental awareness raising and public education would be key factors to achieve the goal.

The workshop also debated key issues of relevance to the relations between North and South. The continuing monopoly of the North over technological means was noted. The export of polluting and resource wasteful technology from the North to the South was noted as a key issue likely to affect the future of industry in the South. The workshop noted the need to develop laws to prohibit the dumping of such technologies. African countries should adopt laws which require that industries moving to the South, from the North comply with standards in their

countries of origin. At least the standards should be no less stringent.

The Workshop had an intense discussion of the new approaches of self-regulation and co-regulation by industry with regard to environmental laws. There was consensus that these were the ways of the future. It was also noted that while it was easy to visualize the application of such concepts to large scale industry, given their resources, it will need more education, training and awareness raising to apply the concepts to small and medium scale enterprises and especially to the informal sector. It was also clearly noted that self-regulation and co-regulation will be employed in addition to, and as a supplement to, the usual tools of environmental law and regulation but not in place of the latter. It was agreed that to achieve compliance the law must retain some teeth in the form of command and sanction instrumentalities.

DISCUSSION OF THE PAPER BY J. NTAMBIRWEKI ON ENVRONMENTAL IMPACT ASSESSMENT (EIA)

The Workshop generally agreed that EIA was an important and key tool for environmental management given its predictive and proactive nature. However, in the discussion a number of key issues arose.

One of the principal questions centred on the thresholds for the requirement of EIA. In view of the width of activities provided for in the laws of the various African countries as requiring EIA, the question was whether and how EIA would be applied to activities of the small and informal sector industries. It was noted that EIA was expensive and could not be afforded by the informal sector, yet, the informal sector was a key source of pollution because of the type of technologies used. Secondly, it was also observed that the informal sector was a source of pollution of concern to environmental management, and was the result of the aggregation of the activities of the total effect of hundreds of participants. There are not always clear point sources of pollution in the informal sector to regulate, monitor and control.

There was no agreed view on how to make EIA applicable to the informal sector. Two proposals were tendered at the workshop. One proposal was to carry out generic EIAs. This was not generally accepted because the EIA purists argued that EIA was individualistic, set against the specific project and technology it will employ, its scale, its location and siting, and the views of the local surrounding community. Generic EIAs were on the other hand arged as the only sensible alternative to "No EIA" for the informal sector. In which case, on appeal against application of the generic EIA in a specific situation can be launched and the merits appraised.

The second proposal was that regional or strategic EIA (or SEA) could be carried out in order to assess possible impacts of such activities. It was noted, however, that such SEA, are not always meant to be conclusive, but should be followed by particular EIA. The debate, therefore, remained open on this issue.

Another question raised was the issue of African Countries' capacity to carry out EIA and of their governments' ability to review the EIS. It was noted that the key question was how to develop capacity by encouraging key cadres of existing professionals in various fields to participate in the EIA process. It was noted particularly that each EIA was unique. It requires expertise not necessarily identical to others. The project determines the range of professionals required. In most countries it was observed that a range of professionals exists and what is now required is to arm those professionals with techniques of EIA. It is, therefore, necessary to develop core groups in each country through which EIA technique can be disseminated to the rest of the professionals.

With regard to EIA, and in particular the environmental impact study, the question was raised whether governments need to hire consultancy firms for the purpose, due to lack of capacity within governments. This view was not accepted. It was stated that the review of EIA was a governmental function. Through appropriate co-ordination through the national authority in charge of the environment the views of the various departments, ministries and parastatal bodies could be sought and where necessary, the views of professional organizations (e.g. an institute of engineers, bankers, architects, medical practitioners, lawyers e.t.c.) could also be canvassed by the national body. Such a method could enable an inter-disciplinary input into the review. It is not expected that Government may at any one time have in any one agency the full continuous ability to meet the requirements for the review of all EIAs. What is at stake and crucial is co-ordination and the bringing to bear on EIA reviews the best range of expertise.

Another issue which was raised was the question of fairness in the review process; how to

ensure that the review process was fair to society and the developer. The principal questions of how to appeal to the public for comments and how to conduct a public hearing were all brought before the workshop. The emphasis, it was felt, should be in ensuring that due process was built into the E.I.A. legislation. Legislation should particularly aim at ensuring full public participation in the process and for ensuring that public officers can account for the decisions they make during the review process. This point relates to interests of the industry as well as that of the public, including intergenerational equity.

The issue as to the need for appeal procedures to ensure due process was discussed. It was felt that executive decisions should be subject to appeal. The appeal processes must depend on the circumstances of each country. It was observed that in some countries appeals to the Minister may politicise the decisions regarding EIA and, therefore, water down its technical character. The general need to enable courts to review decisions of environmental authorities on EIA was stressed. However, it was noted that the role of the courts should be limited to review and not appeal. E.I.A. being a highly technical matter could not easily be amenable to full scale appeals. The courts lack the technical ability to decide upon EIA review decisions on appeal. They can, however, on review determine whether the decisions were reached following due process and following the rules of natural justice.

Another key question which was raised with respect to EIA was the issue of protection of proprietory information. In submitting reports relating to the EIA process, it was noted that full disclosure of the technology to be employed and of the plant design is required. It was noted that such disclosure may affect information protected under certain laws e.g. intellectual property rights. It was noted that most of the emerging legislation on EIA provides a two step process for the protection of proprietory information. The developer can apply to the national authority for treating certain information as confidential. If the national authority determined that such information is confidential, then the authority can rule that it be left out of the record that will be available to the public. The information will nevertheless be made available to the national authority to enable a fair and congent review process.

SUMMARY OF THE DISCUSSION OF THE PAPER PRESENTED BY MR. ANDRE MOOLMAN

The paper brought to the attention of the participants the key and emerging principles of environmental law relevant to industry.

It was noted that along with the development of national laws, there must be an encouragement of the corporate actors to change their attitudes. Corporate philosophies which emphasise the incorporation of environmental concerns in industrial practice should be adopted. One example given was that of the adoption of the "responsible care" philosophy in the Petro-chemical industry. This philosophy emphasises the development of basic guidelines for management and for the promotion of worker safety, and community environmental enhancement. The philosophy also calls for self-assessment through situation analysis for example by completing an annual self assessment form in every branch of the factory. The effect of this is to improve performance all round.

Another key question arising was the issue of confidentiality. It was noted that environmental law requires a lot of disclosure of information. The question is whether this would not affect the confidentiality of manufacturing processes and therefore deny enterprises their competitive edge. It was clearly felt that the linkage between environmental law and the law relating to intellectual property rights had to be fully explained to industry and policy makers. Policy makers and industrialists had to understand that environmental law does not apply in isolation. It applies within the totality of the national legal system. Laws relating to intellectual property rights continue to apply to protect such rights. Information subject to intellectual property rights would be confidential between the public officials and the industry that submits them.

A principal issue for industry which arose in the course of discussion was the ability of industry to respond to changing environmental laws and standards. Often when the law changes it imposes mandatory conditions which, if it were to be complied with, many factories would close. It was noted that there was need to create transitional stages to adapt to new laws and stand-

ards when such changes occur. Entering into agreements between the private sector and Government on how the changes would be met was regarded as essential. It was urged that there was need to develop capacity for private sector-government negotiations. In particular it was noted that these skills should be passed on to local authorities when making and implementing their by-laws.

A question which arose out of this discussion was the relationship between African industry and the promotion of research and development. In particular, the general poor relations between industry and universities was noted. The latter are the centres of research would lead to innovations in the manufacturing processes of industry. The laudable co-operation between industry and universities in the Republic of South Africa was noted as having led to the establishment of Chairs in Universities for research. The workshop urged the creation of such relations in other African countries. While industries in other African countries were challenged to support such ideas, some of the industrialists urged the universities to come up with the relevant proposals.

The issue of spreading awareness of environmental laws through their simplification was urged as a basic necessity to environmental management. Likewise, States and industries were urged to create and maintain inventories of manufacturing processes and their products including wastes and effluent streams as a factor in enabling monitoring and recording improvements in environmental compliance.

The discussions also took into account the problems of compliance by the small scale sector especially the informal sector. In particular, some the standards developed by international institutions such as the ISO 9000 series and 14,000 series had to be made amenable to the small scale enterprises and the informal sector in Africa.

SUMMARY OF THE DISCUSSIONON THE PAPER PRESENTED BY PROF. CLEOPHAS MIGIRO

There was considerable support for the establishment of Cleaner Production Centres in various countries in Africa. The need for support by Governments of such initiatives was urged. Of concern was, however, how such donor driven initiatives would survive after donor funding ends. The workshop noted the various initiatives of the Cleaner Production Centre in Tanzania to achieve sustainability and encouraged it. It was noted that local industries need to do more to promote such initiatives especially by contributing finances and examples for demonstration. A number of African industrialists represented at the meeting noted that clean production was not merely desirable but that it makes economic sense. It ensures minimization of waste and the resources saved end up in beefing up the financial incomes of the industrialists. In Uganda, for example, the initiative of Hima Cement Ltd in reducing losses of up to 80 tonnes of cement per day into the air by installing necessary equipment, was noted. This, it was shown, had increased the factory production considerably.

Cleaner production was understood as a tool to enhance environmental management and, at the same time, maximise company productivity. In this regard cleaner production was shown to be a tool complementary to the ISO 9000 series and ISO 14000 series. A question which arose persistently in the discussion was whether Africa had the capacity to monitor and control pollution. It was noted that such capacity inheres in each enterprise's struggle for self improvement. Cleaner production was the creation of a new attitude towards the management of natural resources and other industrial inputs. Simple controls on such mundane matters as chemicals which spill may bring huge bonuses in the creation of a cleaner environment. Cleaner production was a total approach to also improve worker productivity and safety.

It was also argued that seen as such, cleaner production concept can be used by small enterprises which adopt environmental safeguards. It was noted that the concept was flexible and, therefore, could be adapted to smaller enterprises. A condition precedent for such application is the need to develop awareness and training.

The issue of the need for technology transfer of clean technologies to African Countries was brought up and discussed at the workshop. It was noted that it may not be possible for enterprises which expended heavily in R&D to simply give away their hard-won technologies. It was, therefore, suggested that states should continue supporting the establishment of international funds for the transfer of technologies which do not pollute or which minimize waste. In this regard, the workshop noted existing mechanisms for the transfer of technology such as the Fund established under the Montreal Protocol on Substances that Deplete the Ozone Layer 1987 as amended in 1990.

The workshop also noted that there were a number of clean production technologies which were now in the public domain. States together with industry, it was urged should establish mechanisms to discover and disseminate such technologies which may still be appropriate to Africa. The discovery of such technologies is a research intensive activity requiring accessing various patent offices and other intellectual property rights registration offices, especially in developed countries.

SUMMARY OF DISCUSSION ON THE PAPER PRESENTED BY MR. KARANJA

This interesting presentation was made by an industrialist whose company had attempted to take into account environmental issues in its operations.

It was observed in the course of the discussion that it was essential that industrialists adopt clear environmental policies in the form of policy statements. The statement would establish clear achievable goals. These goals should be complemented by a commitment of management to achieve those goals. Management should deploy actions which leave no doubt as to its commitment commencing with worker-education and awareness promotion as well as rewarding the best achievers among the managers and workers.

It was also noted that it was essential that African industries begin *in situ* research to optimise environmentally sound manufacturing conditions and to reduce waste. Such research would lead to development of new options which lead to achieving new competitive levels. The reliance on public research should, however, not be underplayed. Public research also needs to be supported by industry in order to promote the cross-fertilization between the universities and industry.

Energy was viewed as a principal concern of industry which is also of vital interest to environmental concern. Increased audits of consumption of energy was stressed especially of hydrocarbons, increases the pollution of the atmosphere. Conservation of energy was seen as a keystone in environmental management. The need to carry out periodic energy audits was stressed and it was urged as a means for determining the conformity of actual consumption in relation to the set thresholds. Besides it was noted the optimisation of energy use meant that the industrialist could laugh all his way to the bank.

An issue which was extensively discussed and agreed upon was the role of the state in promoting greater compliance by industry with environmental standards and national goals. The issue of whether the state should provide fiscal incentives for good environmental performers and achievers was canvassed. It was agreed that such incentives should be provided within the economic context of each country and should not create distortions in its social and economic fabric. Such incentives should, therefore, be subject to periodic review to ensure that they remain in context.

New environmental techniques used by industry were explored and applauded. In particular the tools of environmental risk assessment and life cycle assessment were considered. They were considered key tools for corporate environmental responsibility which should be encouraged. In particular, it was urged that African Chambers of Commerce and Industry should take the lead in promoting the incorporation of these tools in the corporate policies of their members.

SUMMARY OF THE DISCUSSION ON THE PRESENTATION OF MR. FRANCIS OKOMO-OKELLO

The relationship of the banking industry to environmental management was a subject of interest to the Workshop. It was new to most of the participants, specifically of interest to the workshop was the concept of lender liability, the causal relationships (chain of causation) that would lead a banking institution to a failed project or a project which does not perform in according with set environmental criteria and standards. It was noted that banks need to protect themselves from the possibility of future environmental failure of enterprises by ensuring that their debtors follow the set environmental standards and become good corporate citizens.

It was urged that African banks should tie financing of new projects to the fact that a project had conducted an EIA and that such EIA had been approved by the relevant national authority. The environmental impact statement and a record of decision should be attached to economic feasibility studies submitted to banks. The banks should take into account the environmental issues on the same yardstick as the financial viability issues. After all, are not the two interdependent in today's environment conscious world?

The workshop, however, noted the dearth of capacity in African commercial banks to make decisions on EIA. It was, however, stated that the banks could off-set that disadvantage by relying on the decision of the appropriate national authorities.

The other issue which arose was how bankers should deal with the financing of small and medium enterprises and the informal sector in relation to environmental issues. The inability of these enterprises in bearing the financial burden of financing studies related to EIA was again raised. The issues relating to the need to finding key modalities for assessing the impacts of their activities, which have been covered above in relation to EIA, were reiterated.

An issue which was raised was whether banks can assist in improving adherence to the law by providing incentives to good corporate environmental performers. It was suggested that banks could for example improve environmental performance by providing preferential interest rates for companies which take the road to cleaner production.

Finally it was proposed that bankers should form a committee in each of the national institutes of bankers, to consider how environmental issues should be integrated in their work.

The role of the insurance industry is fostering compliance with environmental law and providing insurance cover for environmental risks was raised. It was not extensively discussed. It is, however, an issue for future consideration.

SUMMARY OF THE DISCUSSION ON PROF. S. WANDIGA'S PAPER

This paper presented a factual analysis of the environmental crises of African states mainly drawing as an example figures from the East African region.

One of the principal issues which arose in the discussion was whether the positive side rather than the negative side ought not to be stressed. It was agreed that to have a clear picture both sides should be brought out as they realistically appear. Indeed it was observed the paper had successfully achieved that goal and provided the background for the analysis of the applicable legal and policy principles.

It was agreed that most of the important sources of industrial pollution were from imported technologies. The need to monitor and control technologies being imported into Africa was urged, in order for the continent to avoid becoming a dumping ground for obsolete and undesirable technologies.

With regard to the issue of transport, it was observed that it was high time that African countries started developing serious public transport systems and revamped and expanded their railways in particular. This move would save Africa from the problems of acid rain, pollution and smogs. It was further urged that in those countries which have not yet done so, the importation, production or use of leaded fuel should be outlawed.

The pollution of freshwater resources by industrial effluent emissions was considered an urgent issue for attention. It was noted that such pollution had led to the increase in nutrient levels in these fresh water resources leading to the thriving of alien weeds and their consequent negative effects on freshwater ecosystems. The need for co-ordinated responses to the pollution of international water systems, especially Lake Victoria by the riparian states, was urged. Likewise the need for industry to abate their polluting activities through self-regulation was considered a desired change in corporate behaviour.

With regard to Lake Victoria, it was argued that there was need to revamp the Lake Victoria Regional Environment Management Programme. It is essential to strengthen the core co-ordination centre than to let it continue running as if it were composed of three independent national projects. What is of essence, it was argued, is that there should be a harmonisation of the policy responses of the three countries to the crisis facing the lake. This cannot be done by having a project where national interests seem to supersede the core regional and global environmental concerns.

The issue of population growth and its effect on environmental management was debated. It was observed that while population growth itself was not necessarily negative to environmental management, there was need to ensure a sustainable population where the economic social and environmental goods in society could satisfy the needs of the population at a given time.

MABOR'S ENVIRONMENTAL POLICY

Benedita Penicela
Chief Chemist, Mabor

1. INTRODUCTION

Mabor de Moçambique, Manufactura de Borracha, S.A.R.L. has a small tyre factory (23 000 m^2) that produces tyres for passenger vehicles, light trucks and tractors and tubes for the whole tyre line.

The company has a share capital of 22,5 billion meticais and more than 4 billion in reserves. Approximately 540 persons work in the company. More than half of the production is exported to neighboring countries, in particular the Republic of South Africa.

Gross sales will reach 170 billion meticais (16 million US$) and net profits for 1996, before taxes, were above 3 million US$.

In the context of Mozambican industry "Mabor de Moçambique" is considered an example of unusual operational and economical success.

2. MABOR'S APPROACH TO ENVIRONMENT

Mabor takes a serious approach in relation to concerns environmental matters. Working with technology provided by Continental General Tire, Inc. (CGT), Mabor adopted CGT's environment policy. This policy recommends:

- conducting all the company activities in an environmentally conscious manner;
- producing quality products that are safe and have a minimal impact on the environment;
- providing all the employees with safe and healthful working conditions.

Mabor recognizes that sound health, safety and environmental management are essential components of the company's long term strategy for continued success.

Although the company does not possess an organ exclusively dedicated to environmental matters, standards, procedures and work instructions have been established and are continuously reviewed to achieve compliance with the above policy.

All the employees are expected to support Mabor's commitment through their adherence to the policy and participation in programmes designed to train and ensure compliance with safety and environmental regulations.

3. STEPS TO PREVENT ENVIRONMENTAL POLLUTION

Several steps are taken by the company to develop technologies that reduce waste:

- Recently all rubber-curing accelerators that were nitrosamines producing were replaced by others less health threatening;
- A new water treatment system is being put in place to avoid usage of harmful chemicals as anti corrosion agents;
- All workers undergo safety training and are informed of potential health hazards of the products used in the plant operation.

4. RECOMMENDATIONS

Mabor would like to recommend that the Government take action to deal with the widespread environmental concerns within the country, be it from the industrial sectors, of the public in general. Information concerning the environment should be made available to all citizens.

Economic and fiscal incentives should be given to companies that develop or apply non polluting technologies.

NATIONAL INITIATIVES TO PROMOTE INDUSTRIALIZATION WITHIN THE CONCEPT OF SUSTAINABLE DEVELOPMENT

Mrs. Joyce Onyango
National Environmental Secretariat Kenya

1. INTRODUCTON

In the past industrial activities have resulted in widespread environmental degradation. Several documents have clearly defined the Kenya Government policy initiative on sustainable industrial development.

The challenge is to promote industrialization without compromising the ability of resource base to meet the needs of future generations.

2. STRATEGIES TO ACHIEVE SUSTAINABLE INDUSTRIAL DEVELOPMENT (SID)

Some of the proposed strategies to achieve sustainable industrial development in Kenya include:

- Enhancing harmonization, implementation and enforcement of laws for the management, sustainable use and protection of the environment.
- Providing economic incentives and penalties to encourage sustainable use of natural resources and ecological functions.
- Regional and international co-operation co-operative mechanisms including international agreements that Kenya has signed and/or ratified in order to access financial mechanisms, technology and information that will assist in upgrading its current level of technology.
- Capacity building within the public and private sectors for integrating environmental concerns in planning process and project design, implementation, evaluation and monitoring.
- Use incentives, taxes and subsidies to encourage sustainable development.

3. POLICY INITIATIVES

Key objective of the policy initiatives is to move towards an industrial sustainable development path. This is demonstrated in the following policy initiatives.

(i) **National Development Plans (NDPs).**

The National Development Plans are the basis for government and private sector development guidelines. The 7th and 8th NDPs have been specific on issues of sustainable industrial development (SID).

The 7th NDP 1994-1996 whose theme was *"Resource Mobilization for Sustainable Development"* was the first to be prepared after the Rio meeting.

The 8th NDP 1997-2001 whose theme is *"Rapid Industrialization for Sustainable Development"* lays the foundation for the transformation of our country from an economy whose backbone is agriculture to a Newly Industrialized Country (NIC) by the year 2020. The strategy as spelt out in the plan is to rely on agriculture and industry as the twin engines for future economic growth.

(ii) **Financial Incentives**

The 1994/5 Finance Act allowed tax reductions for environmental clean-up operations,

including disposal of effluent and other waste products.

(iii) **Policy on Environment and Development**

The overall policy goal is to achieve economic, social and environmental sustainable development by enhancing the involvement of all stakeholders in the management of natural resources and their living environment (partnership).

(iv) **Legal and Institutions Arrangements**

(a) A draft Environmental Management and Co-ordination Bill is now ready for presentation to Parliament.

(b) Review of sectoral policies and legislative framework for harmonization with the national environmental policy and framework environmental legislation eg. the forestry, wildlife, mining, water, agriculture sectors are in process of reviewing their policies.

(c) The National Environmental Action Plan was formally adopted by the Government in 1994 as a general framework for achieving sustainable development.

(d) Draft EIA guidelines and procedures as a tool for environmental management have been developed. The Environmental Management and Co-ordination Bill outlines the procedures for EIA. At present, many large projects, in both the private and public sectors undergo EIA. By policy all public sector investment projects must have an EIA statement as a condition for funding.

(e) An institutional study for effective environmental management has been completed and the recommendations are already with the Government for consideration.

The Government now emphasizes partnership between government, the private sector, the donor community and trade organizations in the implementation of these policy initiatives. The development of the above strategies have been undertaken with the involvement of the general public, academic and research institutions, non-governmental organizations (NGOs) and the private sector. Government policy is to create a conducive environment for the private sector and other stakeholders to implement policies. The current institutional structure shows a clear direction towards partnerships.

4. AN OVERVIEW OF AN INSTITUTIONAL STRUCTURE TO IMPLEMENT SID:

The National Environment Secretariat (NES) of the Ministry of Environmental Conservation is the Government's arm charged with coordinating all matters pertaining to the environment.

Since environment cuts across all sectors of our national economy, the Secretariat carries out its coordinating role through the Inter-Ministerial Committee on Environment (IMCE).

IMCE advises the Government of Kenya on all pertinent issues both local and international with regard to environment and development issues. The membership of this committee is drawn from Government Ministries/Departments, NGOs, the private sector and universities. IMCE is chaired by the Permanent Secretary of the Ministry of Environmental Conservation.

IMCE has created sub-committees whose membership like the IMCE is broad-based and includes all major stakeholders. With regard to industrialization the following sub-committees are important:

a) **Chemical Management Sub-committee :** Major concerns for this sub-committee are health and safety of chemicals. It is responsible for issues such as pollution control in the chemicals industry and general chemicals usage. It oversees the implementation of the Basel and Bamako Conventions on the Trans-boundary Movement of Hazardous Chemicals.

b) **National Climate Change Activities Coordinating Sub-Committee:** This looks into issues of energy efficiency, emission of green-house gases (GHGs) in terms of sources and sinks, technology transfer and so on. The sub-committee oversees the implementation of the Framework Convention on Climate Change.

c) **National Sub-Committee on Ozone Depleting Substances:** This implements the provisions of the Montreal Protocol on substances that deplete the ozone layer. It works very closely with industries in phasing out ODS especially in the refrigeration sector.

d) **Bio-diversity Sub-committee:** This subcommittee work looks at issues of bio-diversity, including biotechnology, sustaining the resource base for industrialization as the industrial sector in kenya is mainly agro-based, patenting and technology transfer. It oversee the implementation of the Bio-diversity Convention.

e) **Wetlands Sub-committee**: This is mainly is concerned with the conservation and protection of sensitive water ecosystems such as wetlands. It oversees the implementation in Kenya of the Ramsar Convention.

f) **Environmental Impact Assessment Sub-committee (EIA):** This services all sub-committees on EIA guidelines, procedures and so on.

g) **Environmental Economics and Accounting Sub-committee:** This devises methodologies of how environmental issues can be integrated into the national planning process including:

- development of tools for environmental management, incentives, taxes/subsidies
- natural resources accounting (NRA)
- development of sustainable development indicators

Apart from the above specific roles, each sub-committee is supposed to look into issues of:

(i) Capacity building - almost all sub-committees have held at least one national awareness creation workshop and participants have included industries.

(ii) Financing issues have always been a difficult problem. Industries and the private sector are being made aware of environmental funding mechanisms such as:

- The Multilateral Ozone fund under which industries are made aware of and encouraged to adopt sustainable development technologies/practices. Some industries have benefitted from these funds, especially the refrigeration industry.
- The GEF funds. The GEF funds are centrally approved by the GEF National Review Panel which is also composed of industry representatives, among other stakeholders. Very few industries have taken up this initiative.
- The private sector also participates in the Government/Donor Coordination meeting on environment and natural resources sector. This enables information to be disseminated on who is involved in funding and what activities they are funding.

At the District Level:

NES is in the process of decentralizing and has posted District Environment Protection Officers (DEPOs) to provide technical advise. DEPOs are to work closely with District Environment Officers (DO(E) who are district officers charged with carrying out environmental duties at district level. The policy is to establish District Environment Committees (DEC) in every district. DECs involves all major stakeholders at the district level.

5. CONSTRAINTS

The following constraints are being experienced:

1. Gaps in availability, quality and accessibility of data and information which policy makers need to make informed decisions on environment and development or to be able to implement the above policies.

   Nearly all of the above sub-committees are currently working on data needs, e.g. Environmental Economics and Accounting Sub-Committee recently held a workshop on data needs for the implementation of environmental economics and accounting, the Bio-diversity Sub-committee is currently implementing a data management project and so on.

2. Inadequate capacity (be it technical, capital and financial), at the public and private sector level.

3. Awareness at the industry level on issues of

recycling, availability of global funds to improve technology and environmental management generally.

4. Ineffective and inadequate enforcement of existing legislation.

5. Lack of specific environmental emission standards.

6. Limited participation by industry in environmental research and development.

6. RECOMMENDATIONS

1. Intensive capacity building for both public and private sectors to facilitate effective implementation of the above policies.

2. Awareness creation for policy makers in the public and private sectors on the proposed Environmental Management and Coordination Bill and on importance of cleaner production technology, EIA, the role of research and of economic instruments in environmental management.

3. Encouragement of recycling through incentives.

4. More collaboration, coordination and networking within the public and private sectors and with general public on sustainable development policy issues.

5. Creation of cleaner production techniques in the widest sense.

7. CONCLUSION

There is a window of opportunity if Kenya adopts the concept of Ecologically Sustainable Industrial Development as it enters the road to becoming a Newly Industrialized Country by the year 2020. In my view sufficient policy and legislative initiatives are in place. They need to be implemented.

To be effective all these initiatives must reach the developer.

The gathering of information through hard copies, electronic and mass media, its storage, processing and accessibility should be undertaken urgently as part of the industrialization process. This should be treated as a routine and regular activity for policy makers, entrepreneurs, industrialists, professionals and technologists in both the public and private sectors.

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PAPER ON DAVID WHITEHEAD AND SONS (MALAWI) LIMITED

Marcel S. Miteche
Chief Mechanical Engineer

1. INTRODUCTION

David Whitehead and Sons (Malawi) Limited is the largest vertically integrated textile manufacturer in Malawi. The company has a spinning mill at Salima and the main mill in Blantyre. The Blantyre mill employs approximately 3,000 people.

The company was formed in 1966 through a joint venture between Malawi Development Corporation, Commonwealth Development Corporation, and David Whitehead (Technical Services) U.K. When DWS (UK) through Lonrho, divested its interest in the company in September, 1994, the Malawi Government through the Agricultural Development and Marketing Corporation (ADMARC) became sole owner of the company.

Manufacturing reached a peak of nearly 32 million metres of woven cloth sold in 1982/83. The Blantyre factory comprises a spinning section, weaving section, and a dyeing and printing section.

2. ENVIRONMENTAL CONSIDERATIONS

Most operations in the mill have an impact on the environment. However, the most important areas requiring close monitoring and control are yarn wastes (dust) and waste water from the dyeing and printing processes.

2.1 Dust Extraction and Prevention

The spinning, preparation, and weaving departments have been provided with dust extraction and removal equipment to make the environment safe and clean for employees working in these areas. Care is also taken to ensure that dust does not escape from the processing areas into the atmosphere. The wearing of dust masks is mandatory in all areas that are dusty.

2.2. Waste Water from the Dyeing and Prinitng Department

Waste water discharge into the Blantyre sewerage system peaked at 1500 cubic metres per day in 1984 and is currently averaging 500 cubic metres per day. Most of this water is contaminated with chemicals and dyes. A new purpose built oxidation ditch treatment system was installed and commissioned in 1984 in order to improve the quality of trade effluent discharged into the Blantyre network.

The effluent treatment plant was designed to satisfy existing city of Blantyre bye-laws and is guaranteed to give not more than 800 mg/L Chemical Oxidation Demand (C.O.D) after one hour quiescent settling. The pH value is expected to between 8.1 and 8.5. The design B.O.D. (Biochemical Oxygen Demand) is between 15 and 50 mg/L. Suspended solids (S.S.) should be between 20 and 100 mg/L. Our laboratory carries out routine tests to check the conditions of the effluent. The city of Blantyre carries out spot checks to ensure that what is discharged into their sewer complies with their recommendations. DWS is penalized when the BOD level is above the recommended maximum.

3. STEPS TAKEN BY THE COMPANY TO FURTHER REDUCE/ PREVENT/POLLUTION OF THE ENVIRONMENT AND PROCESSING COSTS

There is an Standing Safety Committee which meets monthly to discuss ways of making the work place safe and environmentally friendly.

Management implements the Committee's recommendations subject to financial constraints.

An Energy Management Committee was set up in 1996 charged with responsibility to monitor raw material and energy usage with a view to minimizing waste and ensuring that processes are cost effective. Plans are at hand to re-engineer some of the processes in the dye house to reduce processing stages and minimize waste.

The company is looking at ways of recycling waste water from the dyeing and printing section in view of current problems with the water supply in Blantyre. The technology is available but the investment required is high and not affordable. Considerable savings could be realized even if only 50% of the waste was recycled.

4. IMPLEMENTATION OF ISO 9002 QUALITY STANDARD AND ISO 14001 ON THE ENVIRONMENT

DWS in the process of implementing the ISO 9002 quality standard in all of its operations and is working towards certification in 1998.

By embracing the principles of total quality management, it is expected that documented procedures for carrying out processes will be adhered to at all times. The company is aware of current developments at the International Standards Organization (ISO) for the introduction of and the enforcement in future of the ISO 14001 standard on the environment.

5. THE COMPANY'S ENVIRONMENTAL POLICY

The draft quality manual for the company encourages employees to maintain good housekeeping in all working areas. Plant and equipment must be maintained and kept clean at all times. Waste products must be contained and disposed off so as not to pollute the environment. Once details of the ISO 14001 are available, the company will incorporate its recommendations into existing operations so as to comply with world standards on the environment.

6. DWS' RECOMMENDATIONS TO GOVERNMENTS IN ORDER TO PROMOTE THE USE OF CLEANER TECHNOLOGIES IN INDUSTRY

1. Tax incentives in the procurement of technology for cleaner processes.
2. Closer collaboration between governments and industry to tackle environmental problems and issues.
3. The developed world to promote and fund the transfer of technology to developing and poor countries.

THE MALAWI CHAMBER OF COMMERCE AND INDUSTRY

INITIATIVES BY THE PRIVATE SECTOR ON ENVIRONMENTAL ISSUES

Amongst the many activities that the Malawi Chamber of Commerce and Industry does is that of providing advisory services in the areas of environmental protection.

As such the Malawi Chamber of Commerce and Industry has taken positive steps towards doing that as follows:-

- It is a member of the National Working Group which is looking into the establishment of Malawi National Endowment Fund for Nature. The fund will, among other things, go a long way in teaching Malawians at grassroots level how to preserve the environment.

- As policy advocate the Chamber likes to look at specific issues at committee level. As such it is about to come up with a committee to look at specific issues on environment to be presented to government at their consultative meetings.

- Looking at the whole industry below are some of the initiatives taken by some companies with the aim of preserving the environment:

- Noting that some products or their containers cannot decompose because of the materials of which they are made e.g. plastics, the industries put a label on the container encouraging users not to litter as this might be hazardous to the environment

- Some organizations have policies aimed at encouraging preservation of environment. To this end some companies have assisted the Wildlife Society of Malawi e.g. National Bank initially contribute K190,000 and made another contribution amounting to K1,000,000 to be used for a period of 4 years starting 1984.

- There have also been initiatives by Carlsberg Breweries and Lever Brothers.

ENVIRONMENTAL CONSIDERATIONS FOR THE MALAWI PORTLAND CEMENT COMPANY (1974) LTD

M.B. Dolozi
Senior Lecturer, Chancellor College, University of Malawi

1. INTRODUCTION

The information given here about Portland Cement Company on environmental issues affecting the Company was gained while conducting an Environmental Impact Assessment (Audit) for the company (Dolozi and Krempp, 1997). This exercise was initiated by the Chief Executive of the company Dr. R. Morton through the Department of Environmental Affairs.

It is hoped that the Environmental Impact Audit will be completed towards the end of this year and implemented at the beginning of 1998. This report follows the guidelines prepared by the legal officer for the Department of Environmental Affairs, Mr. E.M. Makawa.

The company'S activities involve mining limestone and using this raw material in the manufacture of Portland Cement. Part of the operations, mining to clinker production, are done at Changalume about 25 km south-west of Zomba town. Milling of the clinker which is blended with gypsum is done at a factory in Blantyre. The finishing process of bagging the cement for consumers is also done in Blantyre.

2. ENVIRONMENTAL UNIT FOR THE COMPANY

At present the company has no environmental unit as such. However the Environmental Impact Audit initiated by the company recommends the appointment of an environmental coordinator. This would enable the growth of an environmental unit with time. The function of the unit will be to coordinate environmental matters within the organization, and with external organizations. The main task would be to oversee the implementation of the recommendations of the Environmental Audit report. Where problems arise the unit/ coordinator would liaise with relevant organizations/individuals to resolve the problems.

3. DEVELOPMENT OF CONSERVATION TECHNOLOGIES

Already the company has taken steps to develop conservation technologies which reduces wastes. At the quarry and factory, dust is recycled and re-used in the process. The company has installed a cover to the crusher unit at the quarry to minimize dust emissions to the air.

Devices to reduce dust emission in the grinder section employs a system of fabric bag filters.

4. RECOMMENDATIONS FOR CLEANER PRODUCTION TECHNOLOGIES

A major problem in the process is dust emissions from the clinker production. There is need to instal more efficient filtering systems in this area. Suitable technologies for this are being investigated including relative costs and proportion of dust reduction achieved.

In Blantyre it is recommended that de-dusting units should be checked more often according to specification. Both the Changalume and Blantyre factories have no significant liquid effluent. However, simple neutralizing systems will be suggested for laboratory discharges.

5. ENVIRONMENTAL POLICY FOR THE COMPANY

The parent organization for Portland Cement Company is the Commonwealth Development Corporation (CDC). This has an environmental policy as follows:

- It is mandated to invest in businesses which are commercially viable; economically sound and meet international social and environmental standards.

- Its statement of environmental policies and procedures recognizes that economic developments results in social and environmental impact; and that successful development must respect the potential of environmental resources, minimize adverse effects, and lead to an improvement in the people's well being.

The recent Environmental Impact Audit has outlined specific policies for the company in Malawi. These are as follows:

Objective 1:

Reduce environmental impacts to air, water and land.

Policies:

a) reduce dust emission from Changalume kiln to acceptable levels by using appropriate technologies.

b) maintains the dust control system at Blantyre factory in good condition by frequent maintenance according to specification of the system used.

c) instal dust containment systems such as covers, to the crusher unit and fabric filters to the grinder.

Objective 2:

Explore cost-effective and environmentally friendly measures of mitigating environmental impacts.

Policies:

a) dispose of used oils as possible alternative fuels.

b) return used oils to supplier with prior arrangement.

Objective 3:

Improve awareness of environmental impacts pertaining to occupational health hazards to all staff.

Policies:

a) prepare posters with important health messages and place at strategic places such as factory, common rooms and offices.

b) conduct workers committee meetings reviewing status of environmental occupational health matters for different sections.

Objective 4:

Liaise with local communities surrounding Changalume with public relations exercise.

Policies:

a) conduct annual meetings with chiefs to apprise then of environmental matters.

b) assist local communities in acquiring seeds and discuss among themselves management strategies for an agro-forestry programme.

6. CONCLUDING REMARKS

The Environmental Audit report is at the moment in draft form. Comments made by various key people have still to be incorporated in the report. It is also hoped that information gained at this Workshop on environmental law will greatly assist in formulating recommendations to the company.

PAPER PRESENTED BY HIMA CEMENT (1994) LIMITED, UGANDA

Mr. Martin H. Froehlich
Executive Advisor, Hima Cement

1. INTRODUCTION

May I first give my thanks to the organizers of this Workshop and to all who are taking care of our environment, and let me say, before coming to the requested theme, that in my view environmental protection is not limited to industry alone, but is a matter of all people living on this planet Earth.

Mankind has in the past exploited the wealth of this Earth in many ways for his own benefit without thinking of side effects and the future of following generations. The rain forests which are responsible for our climate are shrinking, the ozone hole in the atmosphere are increasing, the glaciers are becoming less and less, air pollution is on the increase, just to mention a few without mention also population expansion.

Specialists have estimated when our coal and oil reserves, the most important energy suppliers, will be exhausted. Others have given forecasts of impending decertification if we continue reducing the forest reserves further, but we still allow our farmers to cut down trees without having provisions for re-planting. We see on this continent during every dry season bush-firing, which is a waste of energy sources and detrimental to the natural fertility of the soil. At the same time we are asking industry to observe environment protection.

Many industries realized a long time ago that environmental protection can have economic returns. In the pe-industrial era high chimneys were installed to spread the waste gases over a large area. Today these same industries do not require high chimneys because they have installed units to recover waste materials and their or components. This is an economic measure for industry, but helps the environment.

This Ladies and Gentlemen, are a few introductory comments, which may widen views on the very important issue of environment. Now allow me to go to the details, as requested in the invitation to this function, as they relate to the industry I am representing.

2. DOES THE INDUSTRY HAVE AN ENVIRONMENT UNIT?

The plain answer is yes. Our Factory was built in 1969/70 and was privatized at the end of 1994. Since that time we have an Anti-pollution section, lead by an expatriate Engineer, who is responsible for all dedusting units in the plant.

The Cement industry produces a dusty product. It is a low cost commodity but highly capital intensive in the nature of equipment used so dust prevention has a high priority, as it is not beneficial to environmental conservation alone, but is used also to recover produced materials.

We have different types of dedusting units installed: Cyclones, Air Separators, Cyclone Filters, Bag Filters, and most importantly Electro-Static-Precipitators, all of which are used to separate or to recover dust and/or material.

3. WHAT IS THE INDUSTRY DOING TO DEVELOP CONSERVATION TECHNOLOGY?

The objectives of a cement factory is to produce one or more building products and not to develop technologies to reduce wastes. That is the responsibility of other industries. However under certain conditions the cement industry can be of assistance in the reduction or disposal of waste. Some factories are burning prepared household

waste, others old tyres or used lubrication oil and old painting thinner, as an addition to the traditional fuel used in cement kilns.

Naturally, since to include these waste products in its processes additional installations are required for storage and injection, the disposers of the waste products have to pay the cement producer for the service of taking the waste.

This does not increase production but can reduce the consumption of natural fuels and therefore help in extending the life of existing reserves of irreplaceable natural resources.

4. WHAT STEPS HAS THE COMPANY TAKEN TO PREVENT POLLUTION?

In Hima Cement, we have at great cost and effort rehabilitated the Electro filter, which was not operational for 20 years under the previous ownership. In addition we are modernizing all other dusting units installed in the various section of the plant and where necessary adding new units.

5. WHAT RECOMMENDATIONS DOES THE INDUSTRY WISH TO MAKE?

In our case, we are continuing in the path we have already adopted with regards to dust suppression and the prevention of air pollution.

But this is for us in HIMA CEMENT not the end of the road; we are also thinking about the health of our employees and their families, by running a small hospital supervised by one permanent employed medical practitioner. We are providing school facilities for over 800 pupils. For the majority of our staff, we are giving the staff accommodation in three housing estates.

Last but not least, we are planning trees and greens in our factory and estates wherever possible and we have plans in mind of quarry rehabilitation, after completion of raw material extraction.

This is what we in our industry understand under "environmental protection."

Ladies and Gentlemen, I thank you for your kind attention.

GUINEA

Mr A. Camara

Responsable du programme D.I.E.D Guinée

ABSTRACT

Guinea's economy is essentially based on agricultural activities and the exploitation of mineral resources. Conakry, the capital of Guinea, is the hub of the majority of the economic activities of the country, with a local growth rate actually estimated at 10%. The major industries of Guinea (70%) are located on the sea-shore and most of them constitute a threat to environmental quality; particularly as land-based sources of marine pollution (mineral factories, food processing industries, breweries etc..).

The impacts of pollution in the marine and coastal zones of Guinea were identified in the framework of the preparation of the National Environmental Action Plan in 1994.

There are many categories of land-based sources of pollution which impact on the marine environment. These are waste water from urban households and industries, chemical effluents from agricultural zones, solid wastes found in the marine environment, oil remnants from port activities and gaseous emissions released by mining industries. However waste water from industries is the major factor of the degradation of the marine environment, as there is currently no treatment plant for such waste. Industrial effluents are neither monitored nor treated before their release into the sea.

Because of irrigation, agricultural pollutants deriving from the use of chemical pesticides and fertilizers have extensively polluted some rivers whose waters run towards the sea. Information on this is already being gathered, but there is need to continue data acquisition on the water quality in Guinea. Meanwhile, natural phenomena such as erosion of the sea shore and the destruction of sensitive ecosystems such as mangroves are also increasingly becoming serious problems needing consideration.

The management of solid wastes in major towns situated along the coast is inadequate. This has led to the degradation of the marine ecosystems and the scenic beauty of the cities. The port of Conakry receives around 500 to 600 ships every year, and it is estimated that about 1500 tons of refuse are directly released by these ships into the sea.

Some solutions have been attempted to control marine pollution, particularly with the elaboration and adoption in September 1997 of the Guinean NEAP which is based on an integrated approach. The objectives of the Action Plan are oriented towards the control of classified installations and the monitoring of industrial and other activities which have an impact on the marine environment. But many institutional constraints still hamper the fulfillment of these objectives. There is a need to establish appropriate authorities in order to integrate coastal zones management with social and economic development programmes.

Some technical and financial assistance has been received from FAO (through the WACAF/11 Project) but additional institutional support is required by the Directorate of Environment which is the national focal point for all the environmental affairs.

1. INTRODUCTION

La façade maritime de la Guinée longue de 346 km, a un littoral découpé et pénétré par la mer par d'importants estuaires. Le plateau continental guinéen possède une superficie de près de 43.000 km² et représente la plus grande surface submergée de la côte-ouest africaine en forme de polygone orienté vers le Nord-Sud-Est.

La Guinée possède une superficie de 245.857 km² avec un population de 6.000.000 d'habitants

(1994). la croissance de la population est estimée à 2,8% par an et l'économie est basée sur l'agriculture et l'exploitation des minerais.

La capitale Conakry concentre la majeure partie des fonctions économiques du pays, ce qui lui donne un taux de croissance de 10% environ. Ceci s'explique à la fois par la baisse du taux de mortalité due aux possibilités offertes en matière d'infrastructure sanitaire, mais par l'apport de l'exode rural qui représente 7% de la croissance totale.

Les précipitations annuelles varient de 2.403 mm à 4870 mm tandis que l'humidité relative moyenne est de 62% à 92%

De l'intérieur vers la côte, essentiellement du Nord au Sud, on rencontre huit (8) fleuves principaux qui s'écoulent vers la mer par des estuaires ou des Rio (voir tableau n°1).

Le littoral est sour influence des mangroves (Rhizophora et Avicenia Africana) qui représentent une superficie d'environ 1 million d'hectare. SElon le Schéma Directeur d'Aménagement des Mangroves (SDAM-1992), il existe cinq (5) périmètres forestiers de mangroves réglementés sur le littoral guinéen et classés par ordre d'urgence.

La majeure partie des industries sont concentrées sur le littoral (70%) et beaucoup d'entre elles présentent un certain nombre de risques en ce qui concerne les catégories de sources de pollution du milieu marin provenant des activités terrestres (unités minières, industries alimentaires, brasseries etc...). Les impacts de la pollution dans la zone côtière et marine de la Guinée ont été clairement mis en évidence dans le document de synthèse du PNAE/Guinée, 1994. La charge de la pollution est principalement d'origine industrielle, urbaine et agricole.

2. PROBLÈMES ENVIRONNEMENTAUX: IDENTIFICATION ET ÉTUDES DES PRINCIPALES SOURCES DE POLLUTION ET ÉTABLISSEMENT DES PRIORITÉS PAR CATÉGORIES DE SOURCES.

Il existe six principales catégories de sources de pollution due aux activités terrestres et qui affectent l'environnement côtier et marin. Ce sont:

- les eaux usées d'origine urbaine et industrielle (y compris les eaux usées domestiques),
- les rejets d'origine agro-chimique, incluant les pesticides, herbicides et autres substances organo-chlorées et organo-phosphatées (polluants organiaues persistants) notamment autour des grandes zones d'agriculture intensive, en plus de l'excès des charges nutritives,
- les modifications physiques du littoral en particulier l'érosion côtière, la salinisation et la tannification, la surexploitation des mangroves, la sédimentation, l'ensablement et l'acidification des sols,
- les détritus, déchets solides, matières plastiques et les débris marins,
- les métaux lourds souvent à l'état de trace (les huiles et les hydrocarbures provenant des rejets et effluents industriels, urbains et des sites portuaires,
- les polluants atmosphériques dont les données sont très rudimentaires, mettent en évidence les risques du point de vue santé publique (émission dans la couche atmosphérique de monoxyde et de dioxyde d'azote, d'alumine et de carbone) dues d'une part aux rejets des unités minières et industries diverses, d'autre part aux véhicules en circulation.

2.1. Les eaux usées d'origine urbaine et industrielle.

Le secteur de l'assainissement des eaux usées qu'elles soient industrielles ou municipales, se caractérisent par son originalité. Cette source de pollution constitue l'un des principaux facteurs qui contribuent à la dégradation du milieu marin et côtier de la Guinée.

En dehors du réseau séparatif d'évacuation des eaux usées situées dans la Commune de Kaloum et quelques installations dans la cité de Kamsar (Boké), l'essentiel de l'évacuation des eaux usées se fait par fosses et par l'épandage au sol. Il n'existe actuellemetn dans les régions côtières de la Guinée aucune installation de traitement ou de prétraitement des eaux usées.

Quant aux rejets industriels, ils ne sont ni contrôlés ni traités. Les eaux usées posent des problèmes les plus aïgus entraînant dans la plus part des cas l'eutrophisation des eaux côtières,

mais aussi leur contamination bactériologique et microbiologique comme le cas du fleuve Konkouré aboutissant dans la baie de Sangaréah.

2.2. Les rejets d'origine agro-chimique, l'excès de charge nutritive et pollutions organiques persistants.

Ce sont les formes de pollution d'origine agricole. Elles prédominent généralement autour des uperficies irriguées (domaine fluvio-marin). L'embouchure du fleuve Konkouré et le delta du fleuve Boffon sont des exemples concrets, bien que la plupart des substances utilisées sont d'origine chimique (engrais, pesticides, herbicides et autres biocides y compris certaines formes de polluants organiques persistants).

L'excès de fertilisants infiltrés dans les eaux superficielles ou souterraines contribue aussi àl'enrichissement des eaux et par conséquent à son potentiel d'eutrophisation surtout en saison des pluies.

Bien que des informations notables aient étéobtenues au sujet de ces formes de pollution côtière, l'acquisition des données plus concrètes et continues pour suivi réel de l'évolution des ces différents contaminants dans des milieur aquatiques guinéens est une nécessité.

2.3. Les modifications physiques du littoral, la destruction des habitats sensibles et l'érosion côtière.

La côte guinéenne est soumise à la prédominance des vents de mer (45m/s) et à l'influence des marées semi-diurnes.

Sa topographie déprimée permet parfois à la marée de remonter très loin en amont de certains fleuves favorisant ainsi le développement de la mangrove et la submersion des champs.

L'érosion côtière qui s'exerce surtout au dépend des rivages établis dans les formations meubles, constitue l'un des principaux facteurs de dégradation physique du littoral de la Guinée.

Des études effectuées par le CERESCOR ont démontrées des reculs rapides du trait de côte.

Les zones les plus concernées par l'érosion côtière sont localisées à Koba situé dans la partie Nord du littoral, Tabounsou situé dans la partie Sud du littoral et aux alentours de la Presqu'île de Conakry.

A Koba et à Tabounsou, plus de 1,80 m par an de recul du trait de côte ont été mesuré. Les ncauses de cette érosion sont l'extraction de sable par les soci_0tés et par la population riveraine.

A la presqu'île de Conakry, beaucoup d'infrastructures touristiques, port de Conakry et maisons d'habitation construit sur le rivage de la mer sont menacées par une érosion de côte.

Une large part de l'accélération du processus de l'érosion littorale est due aux effets hydrodynamiques, morpho-sédimentaires, variations cycliques, anthropiques et à des actions humaines (fermeture digue de protection au port de Conakry, dragage du chenal d'accès et bassin portuaire, extraction du sable marin, côtier, occupation anarchique du rivage de la mer par des constructions d'habitation, etc...).

Ces modifications écologiques naturelles ou anthropiques peuvent conduire si elles persistent, à des pertes de diversité biologique et parfois à une dégradation complète de l'écosystème.

2.4 - Les détritus, déchets solides, matières plastiques et débris marins.

Les détritus, déchets solides, m atières plastiques et débris marins se retrouvent généralement dans les grandes villes comme Conakry, Dubréka, Boké, Coyah et qui sont toutes situées prks de la côte ou adjacente au bassin versant d'un cours d'eau. Les services fournis actuellement en ce qui concerne le traitement de ces déchets consistent essentiellement en la collecte et leur transport sur le site des décharges non contrôlés situés généralement en pleine zone urbaine et sans aucun plan d'aménagement. Le site de décharge de la minière àConakry fait une superficie de 2 hectares et est entouré d'habitation. Les problèmes environnementaux et de sécurité posé par cette décharge sont énormes (contamination des nappes d'eau superficielles, perte d'attrait historique et valeurs d'agrément, dégradatin des écosystèmes marins et côtiers). Comme exemple, nous avons la contamination des eaux côtières dela baie de Sangaréah, l'accumulation de déchets solides et autres débris au Nord de Conakry.

2.5 - Les métaux lourds, les hydrocarbures et les polluants atmosphériques. Les rares analyses cocnernant la contamination des eaux marines et côtières par les métaux, les hydrocarbures et les autres micro-polluants ont

montrées que ces sources de pollution proviennent des zones industrielles, des ports maritimes, des aires de navigation et des centrales thermiques.

Ces différents types de pollution sont concentré autour des unitées minières de Kamsar (Boké) et Friguia-Kimbo avec la boue rouge sur le fleuve Konkouré, la capitale Conakry àcause du d garage du Gouvernement, vidange de camions etc... Par exemple, la seule ville de Conakry consomme 2.500 tonnes de lubrifiants, ce qui représente 1.100 tonnes d'huiles usagées qui sont rejetées sans aucun traitement soit même le sol et donc vers l'acquifère, soit directement à la mer par les caniveaux d'évacuation des eaux de pluie. Le port de Conakry reçoit entre 500 et 600 navires par an qui déversent 1.500 tonnes de résidus directement àla mer. Tout ceci explique encoure une fois la concentration de plus important de ces catégories de sources de pollution.

Il est à signaler que les effluents toxiques provenant des rejets industriels et miniers sont àl'origine de pollution sur des portions importantes de certaines rivières, baies situées aux abords de Conakry (rejet de la soude caustique). Des observation et des mesures réalisées par le CERESCOR à des périodes régulières sont devenues une nécessité plus particulièrement dans la ville de Conakry et sa partie périphérique. Cela devrait permettre d'identifier les zones les plus affectées pr les effluents et les rejets miniers, industriels et artisanaux, mais aussi celle qui sont les plus sensibles en matière de pollution due aux activités terrestres. Aussi, le contrôle concernant la pollution par les produits pétroliers serait nécessaire à cause des opérations fréquentes d'avitaillement des bateaux et des possibles déversements accidentels de p_0troles et produits chimiques nocives ou dangereux.

Autres sources de pollution à mentionner surtout dans la ville de Conakry, de Kamsar et de Friguia, est l'introduction des émissions dans la couche atmosphérique de gaz, de fumées, de poussières et autres substances provenant des établissements agricoles, industriels, commerciaux ou artisanaux, véhicules et unités minières.

3. SOLUTIONS EXISTANTES ET/OU PRÉCONISÉES

Il est clair que dès Septembre 1997, la République de Guinée a adopté son Plan National d'Action pour l'Environnement (PNAE). Ce plan d'action a pris en compte tous les paramètres environnementaux y compris la protection du milieu marin contre la pollution due aux activités terrestres ainsi que la gestion intégrée des zoneslittorales et cours d'eau.

Le Plan National d'Action pour l'Environnement **(PNAE)** à fixé les objectifs de gestion suivants:

- fournir le soutient financier et technique requis à la Direction Nationale de l'Environnement à travers les partenaires afin de lui permettre d'atteindre les objectifs de prévention, de réduction ou même d'élimination de la pollution et de la dégradation de l'environnement marin, côtier et fluviaux pouvant provenir des activités terrestres,

- assurer le contrôle du milieur marin et des eaux adjacentes contre la pollution due aux polluants d'activités humaines ou terrestres et évaluer l'impact de ces polluants par des procédures souples avant tout rejet dans les eaux marines côtiers et fluviales.

- tenir le répertoire national installations classées et autres activités terrestres et recommander les prescriptions nécessaires à respecter en matière de protection et de gestion de l'environnement sur les problèmes que posent des activités notamment en ce qui concerne le traitement des déchet ou eaux usées, le système de recyclage des autres formes de réduction des risques de santé publique

- assurer la protection du littoral contre l'érosion côtière et procéder à la protection des habitats aquatiques (essentiellemetn la mise en oeuvre des programmes d'amenagemetn et de gestion intégrée des zones côtières),

- renforcer et appliquer les mesures législatives (code de protection et de mise en valeur de l'envrionnement) et d'incitation économique favorisant l'application de technologies non polluantes.

4. CONTRAINTES INSTITUTIONNELLES ET FINANCIÈRES

Afin de résoudre les problèmes environnementaux concernant le milieu marin et les zones côtières, le PNAE a prévu la mise en place d'une Autorité nationale du littoral qui pourrait intégrer la protection du milieu marin et des zones côtières

aux politiques de développement socio-économiques.

Cetter autorité du littoral qui serait installé à la Direction Nationale de l'Environnement (DNE) est responsable de la coordination, du contrôle et del'implantation des programmes de gestion et de protection ainsi que des règlements et lois concernant la protection de l'environnement en Guinée. Différents départements ministériels, Agences et ONG qui composent cette autorité, vont tentés d'aborder les problèmes spécifiques et faciliter les actions à mener.

5. ASSISTANCE (ACTUELLE OU REQUISE)

La Direction Nationale de l'Environnement a bénéficié d'une assistance de la FAO à travers le projet [Gestion intégrée des zones littorales (WACAF/11)]. Il serait nécessaire d'apporter un support institutional à la DNE pour la permettre de mieux assurer la coordination des activités énumérées au point 4.

6. STRATÉGIE NATIONALE

La Direction Nationale de l'Environnement créée en Mars 1986, est responsable de la mise en oeuvre des programmes et politiques nationales du gouvernement en matière de protection et mise en valeur de l'environnement en République de Guinée. Elle est chargée d'assurer la mise en oeuvre efficace des différents programmes et stratégies recommandées par le PNAE.

Même si le développement du tous ces programmes et options stratégiques constituent des étapes positives pour la gestion du littoral guinéen, il demeure que des actions concrètes résultant de ces programmes devraient être développées.

Pour cela, les éléments suivants ont été recommandés:

- assurer une meilleure coordiantion entre les différents plans sectoriels qui ont d'importantes composantes environnementales comme les domaines marins et côtiers, les départements et les agences dont les mandats se recoupent très souvent,

- promouvoir une meilleure participation des communautés à la bse, les femmes, les acteurs socio-économiques, les ONG et les scientifiques par le biais des actions de développement dans les zones côtières et fluviales.

- renforcer les capacités nationales en matières de ressources humaines et dé développer les stratéges afin d'améliorer le cadre de vie des populations riveraines,

- intégrer dans les politiques de gestion des zones côtières les groupes cibles principales afin de lutter contre les pollutions dues aux activités terrestres,

- assurer l'éducation et la sensibilisation du public pour leur intégration dans les programmes de lutte et de gestion en ce qui concerne la protection durable des zones côtières.

- adhérer aux accords et programmes régionaux et internationaux appropriés en vue d'une coordination efficace des activités choisies du programme d'action. Cela suppose qu'il faut évaluer et créer un centre d'échange favorisant la coopération entre les Etats et les institutions nationales impliquées dans les domaines scientifiques et techniques en vue de prévenir ou réduire l'impact des activités terrestres sur le milieu marin et côtier.

<u>Activites initiees dans le cadre de l'environnement et de developpement des technologies de conservatino</u>

- Code sur la protection et la mise en valeur de l'environnement.

- Centre National d'informatin chimique de Guinee C.N.I.C.

Il fournit toutes les informations fiables et pertinentes en matiere de gestion ecologiquement rationnelle des substances chimiques et dechets dangereux.

- Monographie nationale sur la diversite biologique.

- Preparation des strategies et plan d'action sur la diversite biologique.

- Projet de gestin des bassins en cours en haute Guinee et en Moyenne Guinee.

- Le decret exigeant une etude d'impact environnementale avant toute implantation du projet.

- le Pacipe: Pour l'education, la sensibilisation, la formation a la prise en compte de l'environnement.

- Le CERE: Centre d'etude de recherche et d'education environnementale.

- le DIED: Programme de developpement industriel ecologiquement durable en perscrtive.

THE INDUSTRIAL ENVIRONMENTAL FORUM OF SOUTHERN AFRICA

A model for promoting business and government partnership in addressing environmental management and regulation concerns

By Karin Ireton
Manager, Industrial Environmental Forum

1. INTRODUCTION

The Industrial Environmental Forum is a business forum dedicated to raising the profile, understanding and application of sound environmental management within the Southern African business community. It is a vehicle for business to use in increasing its own understanding of the issues, of publicising good practices and relevant examples and increasing the use of appropriate management tools. It also acts as a voice for business in negotiating with government and other stakeholders on the development of environmental policy, legislation and regulation practices.

The Forum was created in 1990 by a group of leading businessmen in South Africa who foresaw the increasing importance of environmental management and its potential to be either an opportunity or a threat. While there are many other sector-specific organisations which address environmental issues of concern to their sectors, the IEF is multi-sectoral and thus seeks to find common concerns and generic lessons which can be learned and applied across the spectrum.

The Forum_s model has been replicated in Zimbabwe, Namibia and Mozambique. In addition, a seminar was held two years ago in Tanzania with the aim of encouraging the setting up of similar forum there. In all cases the success or failure of these models has depended on credible corporate champions taking a leadership role in creating and guiding the early activities of the Forum and to an extent picking up the tab.

It is our belief at the Forum that, because we address issues of primary concern to business and seek to promote the integration of environmental issues within business practice the Forum is best funded by the business community. Accordingly, it should focus on the business community's level of environmental awareness, its particular needs and its commitment to environmental issues.

2. ACTIVITIES

Since its formation the Industrial Environmental Forum has undertaken a number of significant activities to promote sound environmental performance. In 1991 it held the first major business and environment conference in Africa, the Southern African International Conference on Environmental Management. It attracted more than 400 people - in particular senior businessmen, academics and senior policy makers. Much of what was communicated at this first business and environment conference originated from abroad, particularly from the developed countries, and concerned the trends and issues dominating the agendas of those countries.

The Conference was a resounding success and spawned the formation of both the Namibian and Zimbabwean counterpart organisations. By 1994 when we co-organised the second SAICEM conference with the Environmental Forum of Zimbabwe the focus had changed somewhat and the conference focused one examples from Southern Africa which could be replicated throughout the

continent. It was extremely valuable to see and document the significant progress that had been made in the three years between 1991 and 1994.

I will focus on what has happened within our own organisation and our own country since then and the role that the IEF has been able to play in mobilising the business community to take environmental issues more seriously and to involve themselves in policy debates in order to be aware of the changes ahead.

The IEF is a members organisation. It maintains only a very small secretariat and constantly calls on the expertise and voluntary action of members to carry out its functions. Our modus operandi is therefore to keep a balance between what the secretariat does and what the members are doing within their own organisations.

We use a number of different methods to undertake our task:

- Formal meetings of member three times a year at which we seek a balance between:
  1. information to members on developments abroad, particularly in the major trading partner countries;
  2. information to members on developments relating to key environmental conventions and international agreements;
  3. feedback from members on lessons they have learnt either accidentally or by applying new management tools and implementing new ideas and systems;
  4. guest presentations from academics, leading thinkers and others.
- Constant public presentations to spread the message of environmental management via public seminars, talks to management teams within companies, articles in the media and trade journals and so on to spread the message of good environmental management.
- Presentations to Ministers and parliamentary committees regarding environmental management concerns.
- Workshops for environmental professionals to address specific issues, eg waste minimisation, in greater detail.
- Working in partnership with other organisations to co-host seminars and conferences.

Since 1995 when South Africa embarked on a major revamp of all its environmental and other policies a major element of our activities has been participating in the development of policies. We represented the business community on the steering committee for the Consultative National Environmental Policy Process, which resulted in a White Paper being published recently. We are on the reference group for a legal reform process which is due to start soon and have participated actively in the Integrated Pollution Control Process and the rewriting of the Water Law, of the policy on bio-diversity and of the forestry policy.

Since 1996 Cleaner Production has become a major new area of focus, following the participation of the secretariat in the Fourth High Level Seminar on Cleaner Production held by UNEP in Oxford, England. At every meeting during 1996 and since then cleaner production has featured on our agenda either in the form of a presentation or as feedback on developments.

We are currently working with the Government and other stakeholders to co-host a regional conference on cleaner production in South Africa in May of 1998.

3. RECOMMENDATIONS

It is our belief that in all of Africa there is one common constraint which requires innovative thinking if we are to achieve cleaner production and sustainable development. We cannot view cleaner technology as an "Open Sesame" which will instantly transform our societies. We must develop policies and regulatory systems which take appropriate cognisance of the limited capacity of governments to regulate and enforce environmental legislation and the limited capacity of the business community to buy into clean technology on a large scale immediately.

We must firstly view cleaner production as having both an attitudinal and mind set element and a technology or process element. The must be addressed in order by dealing first with the attitude element and then focusing on the technology element. We must also ensure that we promote appropriate technology and do not end up once again creating graveyards in Africa for expensive European technology, because it can-

not be serviced and is inappropriate for our conditions and our worker skills levels.

This will require far greater interaction between interested parties throughout the continent, particularly within the various regions, to ensure harmonisation of approaches where possible, in order to benefit from economies of scale and to maximise capacity building programmes.

It is also clear that incentives, not just enforcement, will be more effective in changing the mind set of the business community towards the introduction of new and more sustainable ways of doing business. Incentives could be by way of inducements to hasten investment in newer and less polluting technology, or the provision at subsidised prices of assistance, including assistance with energy audits, cleaner production assessments and increasing the availability of resources which business needs to realise the opportunities to improve profitability which cleaner production often brings.

INDUSTRY AND ENVIRONMENT - F.K.E.'s ROLE

Aly Murji

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I. INTRODUCTION

Kenya's industrial sector ranks high amongst those of sub-Saharan African countries. As Kenya intends to be a newly industrialized country by the year 2020, renewed industrial growth must take place within sound ecological and commercial management principles. This has been highlighted as a priority in the Sessional Paper on Industrial Transformation to the Year 2020.

To support Kenya's effort in promoting ecologically sustainable industrial development, the private sector, educational institutions, international organizations and non-governmental organizations all have important roles to perform.

This paper intends to provide the participants of this Workshop with an overview of the challenges faced by, and initiatives and activities of the private sector, specifically, the Federation of Kenya Employers, in environmental aspects of industrialization.

2. THE ENVIRONMENT AND INDUSTRIAL ACTIVITIES

Kenya's industries are concentrated mainly in and around the major urban centers in the country, viz. Nairobi, Mombasa, Kisumu, Nakuru, Eldoret, Nyeri, Thika and Athi River. The industry sub-sectors include:

- Food Processing
- Chemicals/Petrochemicals
- Leather Tanning
- Metallurgical
- Paper and Pulp
- Plastics and Rubber
- Printing and Packaging
- Textiles
- Others - Pharmaceutical, Motor Vehicle Parts and Assembly, etc.

The industrial sector is dominated by agro-based industries which are food, fruit and vegetable, beverages, textiles, and furniture and wood processing. Agriculture alone accounts for about 25% of the country's GDP while manufacturing contributes approximately 13%. Kenya's manufacturing sector has over 600 large- and medium-scale enterprises, over 800 small-scale units and over 2000 informal sector workshops, including the Jua-Kali sector.

The nature and extent of environmental impacts of any industrial concern will depend on the following factors:

i. the nature and quantity of the raw materials used during the manufacturing process;

ii. the production technology and production capacity utilized by the manufacturing plant and machinery; and

iii. the nature and quantity of the waste by-products or pollutants generated during the manufacturing process.

A more detailed study would be needed to indicate clearly the various pollutants and wastes associated with each type of industrial concern.

3. NATIONAL ENVIRONMENT POLICY

The Government's commitment to conservation and sustainable use of resources has been stated in all national development plans since independence. Sessional papers and presidential directives have frequently emphasized proper management of the national resource base. The 1994-96 National Development Plan detailed the Government's commitment to integrating environmental considerations into development programmes and projects. It plan calls for increased efforts towards management and conservation of the environment. This same called is echoed in Sessional Paper No. 2 of 1996 on "Industrial Transformation to the Year 2020".

As a strategy for achieving sustainable development in Kenya, and as a basis for translating Agenda 21 - The Global Programme of Action on Environment and Development, a national environmental policy is being developed to provide guidance for action in all sectors.

The National Environment Action Plan (NEAP) Report of June, 1994 addresses environmental issues in a cross-sectoral and integrated fashion. The NEAP process has been one of the main activities of the government in the environmental field in recent years. The NEAP's main objectives include:

- facilitating optimal use of the national land base and water resources in improving the quality of the human environment;
- promoting the sustainable use of natural resources to meet the needs of the present generation while preserving the ability to meet the needs of future generations;
- treating environmental conservation and economic development as integral aspects of the same process of sustainable development;
- generating income, and meeting national goals and international obligations by conserving bio-diversity, reversing decertification, mitigating effects of disasters and maintaining the ecological balance of the earth.

The following environmental problems have been highlighted through the NEAP Report:

- air and water pollution from factories and the use and abuse of fertilizers, pesticides and herbicides;
- increased emissions of greenhouse gases and ozone-depleting substances from industry, transport, domestic sources and natural sources;
- increased discharge of pollutants into lakes, rivers and other water bodies with a potential health risk, often as a result of inadequate waste water management by industries; and
- increased problems arising from solid waste.

The NEAP Report also highlights actions that can be taken immediately. Among these the following ones are relevant to industry:

- involve business and industry in reducing pollution and managing waste, including its discharge and storage;
- review and enforce regulation to deter pollution and encourage recycling, and institute polluter charges to discourage polluters.

Some selected priority activities that require funding for implementation include, economic incentives for the promotion and support of cleaner production technologies.

A National Environmental Management and Coordination Bill has also been drafted.

4. PRIVATE SECTOR INITIATIVE - Federation of Kenya Employers

The Federation of Kenya Employers (FKE) was established in 1959 to encourage the development and maintenance of good relations between employers and employees, promote sound management practices amongst employers, and represent and advocate the views of the Federation to the Government and other authorities.

The membership of the Federation covers employers in all sectors of the economy, except the Civil Service, the Armed Forces and the Teachers Service Commission. It is therefore the most representative employers' body in the country. In 1996, its membership comprised 2055 direct members and 940 individual members in

affiliated associations, bringing the total number of employers served by the Federation to 2995.

The Federation's vision states in part that it aims .... "to be the principal private sector organization for promoting the competitiveness of Kenya's products and services both in the local and global export markets through the improvement of safety, quality and productivity in enterprises".

The FKE Mission Statement is "To continuously raise the social consciousness of Kenyan employers through the promotion of sound management and industrial relation practices in order to enable them promote free enterprise, influence and control the business environment, create quality and productivity awareness, improve profitability, and foster growth and employment".

Some of the objectives articulated in the Federation's Corporate Strategy (1995-2000) which are relevant to enterprises are:

- to provide regular and in-house management training courses;
- to inculcate the practice of sound and effective management in enterprises for improved efficiency, sustainability and profitability; and
- promote productivity improvement processes.

In the course of time, the Federation has expanded its role and functions to include management training and consultancy, executive selection, entrepreneurship development programmes, export promotion, total quality management (TQM) and ISO 9000, productivity improvement programme, environment management and ISO 14000.

The FKE has built strong competence in the provision of services in the above fields and is well placed to play a catalytic role in partnership with the private sector in the socio-economic development of the country.

5. FKE'S ACTIVITIES IN ENVIRONMENT ISSUES

The Federation is seriously concerned with environmental issues, especially with regard to personnel and industry. It was initially involved in the preparation process of the UNCED (the Rio Conference, 1992), but is no longer represented on any of the committees.

a. Training Seminars

The first FKE/ILO/UNEP Seminar on Working and General Environment was held in Nairobi in November 1986. It was attended by thirty participants from industry. The resource personnel included officers from the ILO, the Factories Inspectorate, the public sector and the Federation. At the end of the Seminar, the participants put forward several conclusions and recommendations in respect of the general and working environment. (A reprint of the full article, including the recommendations which appeared in the FKE Newsletter No. 191 of 27th February, 1987 is in Appendix A).

The FKE's Training Department has been running courses dealing in environmental issues specific to industry. Currently, it conducts three specific courses on environmental issues: Occupational Health and Safety; Production Management and Control; and Environmental Management. Another FKE seminar that now also has a component on environmental issues is Preventive Maintenance and Management (with Industrial health and safety, and environmental concerns included)

The Environmental Management Seminar, which targets decision makers and senior managers, aims at enabling the participants to formulate and implement sound environmental management programmes in their enterprises. The Seminar content includes global trends in environmental management, national laws, the National Environment Action Plan, pollution prevention and waste minimization, environmental protection strategies and priorities, sound technologies and processes, E.I.A., and so on.

In addition, in 1996 the FKE's Training Department organized 26 open and 34 in-house Management and Supervisory related seminars and courses which were attended by 923 participants from 175 organizations.

Course participants are largely derived from the private and public sectors and the training is conducted by a team of local resource personnel. The Federation itself has three professionals to assist with coordinating and conducting the courses. Training programmes are also offered in-house to companies.

b. FKE/ILO/UNEP Project on Employers' Organizations and Cleaner Production

In October 1996, the Federation participated in the Cleaner Production Workshop in Harare, Zimbabwe. The Workshop was organized under the ILO/UNEP Project on Employers' Organizations and Cleaner Production. It was held in preparation for the implementation of the project in selected Eastern and Southern African countries. The FKE has committed itself to implementing this project on a pilot scale in 5 industrial enterprises. Emphasis is placed on no-cost or low-cost "good housekeeping" waste minimization measures, and on the value of workers' participation in the identification and implementation of such measures.

The first high-level Workshop on Cleaner Production for Chief Executives and Senior Managers in Industry was held on 6th and 7th March, 1997 in Nairobi. Five industries have subsequently been enlisted. Training in conducting waste minimization audits and in analytical tools for identifying cleaner production opportunities in four of the enterprises has been completed.

The project expects the enterprises to identify waste minimization options which would be implemented. At the end of the project an audit is undertaken to gauge the results.

c. ESID in Kenya Project Survey - Environment Impact of SSEs (preliminary data)

About 100 Small Scale Enterprises (SSEs) in the Nairobi area from the following sub-sectors were surveyed: Plastics, Chemical Metal Plating, Metal Works, Printing, Food Processing, Paint, Insecticides/Pesticides, Pharmaceutical and Leather.

Major Findings

Raw Materials

- Many of the substances used in the pharmaceutical, chemical, metal plating, insecticide and leather industries are toxic and hazardous, with some being explosive;
- Some of these substances are found in the waste water which ends up in the main sewerage system.

Water, Electricity and Other Fuels Consumption

- The food processing industry is the major consumer of water and electricity followed by the chemical industry;
- Alternate sources of energy used include furnace oil, diesel, paraffin, kerosene, LPG, wood and charcoal. Such sources are frequently used when electrical power supply fails;
- Metal -working and -plating industries are the lowest consumers of water but consume substantial amounts of electricity and other fuels.

Waste Water

- The food processing and chemical industries are the major generators of waste water;
- A few of them treat the waste water prior to discharge into the main drainage system; others use the septic system to settle the solids before discharge into the main drainage;
- Some SSEs hold the waste water in man-made dams and ponds. It eventually leaches into the ground and spills over into surface water sources.

Gaseous Emissions

- Chemical, metal plating and some plastic industries release untreated toxic and noxious gases into the atmosphere;
- The only chemical industry surveyed that burns emitted gases is the used-oil refinery;
- None of the SSEs collect dust/particulate - it is simply released into the atmosphere;

Solid Wastes

- Almost all SSEs surveyed produce some form of solid wastes - about 20% reported these to be packaging waste, and the rest to arise from their production processes;
- Some solid wastes contain heavy metals and chemicals which are toxic and hazardous while others are explosive;

- About 40% of the SSEs either recycle or sell their solid wastes to dealers; the rest dispose of it in City Council dump sites and landfills.

Industries lacked .....

- knowledge of the chemical composition of the waste water, emitted gases and solid wastes they generated;
- information on the effects of the various wastes on the environment;
- data on the amount of wastes discharged from their operations;
- special handling equipment and safe handling procedures for chemical raw materials and wastes.

6. CONCLUSION

Cleaner Production - A strategy for improving environmental performance

Economic activity contributes much to the environmental challenge, with every enterprise having a varying degree of environmental impact. Environmental legislation in Kenya is sure to have far reaching effects especially for the growing industrial sectoral. Tougher regulations may possibly result in increasing environmental costs of doing business.

While a regulatory framework is necessary to set standards and encourage compliance, it is not sufficient in itself to motivate all concerned to achieve the best practice. It will be necessary to raise awareness of environmental concerns and the consequences of neglect. Therefore, it is essential that enterprises be brought into the effort for a cleaner tomorrow, to work in support of it rather than to be dragged along reluctantly. Environmental concerns must be made part of enterprises' investment, technical and management decisions.

Advances in protecting the environment will have only a limited effect if enterprises do not adopt measures to reduce wastes and pollution. Waste reduction measures, like improvements in house- keeping and better operating practices, need not increase costs significantly but can have significant benefits for the environment and, where it reduces wastage or effluent treatment costs, for the business as well. Receptivity to environmental concerns by enterprises will be found only if they can be shown that they stand to gain in business performance if they improve their environmental performance.

Environmental goals may not be economically viable through the "pollution control" approach. Moving from pollution control (e.g. end-of-pipe treatment) to prevention (e.g. source reduction) is a strategy which enterprises must be convinced about. Hence, switching to a comprehensive application of cleaner production inevitably requires a long process of education and training in order to cause a fundamental change in people's behaviour.

APPENDIX 'A'

(The following article is a reprint from the F.K.E. Newsletter No. 1919 of 27th February, 1987 pp 10-13).

THE 1ST FKE/ILO/UNEP SEMINAR ON WORKING AND GENERAL ENVIRONMENT

The Seminar was held at the Panafric Hotel from 3rd to 8th November, 1986 and was attended by thirty participants.

The Seminar was officially opened by Hon. J.J. M Nyagah, Minister for Environment and Natural Resources. Other speakers at the opening session included Mr. H. Hammer, Director of the Bureau of Employers' Activities, I.L.O., Mr. H.M. DeLemos, Deputy Assistant Executive Director, U.N.E.P. and the Federation's Executive Director, Mr. T.D. Owuor.

The participants were called upon to come up with a national environmental plan of action which would be recommended to the relevant authorities and employers for follow-up action.

The resource personnel during the seminar was wide and varied and included Officers from the I.L.O., the Factories Inspectorate, the public sector and the Federation.

At the end of the seminar, the participants proposed the following conclusions and recommendations in respect of the general and working environment:

The general environment:

1. Environmental management should not be viewed in isolation, but as an integral part of sound economic and social development.

2. Increased co-operation between government and industry to further environmentally sustainable development is essential.

3. The FKE and all employers in Kenya should increasingly be involved in the decision-making process concerning the management of the environment, bearing in mind that they will be the main implementors of these decisions.

4. Prevention of damage to the environment is preferable to the burdensome and expensive repair of damage already done. The FKE and its members could play a particularly important and guiding role in this sphere.

5. Recommended paths towards an environmentally sustainable development, should include:

   - securing basic needs of people as well as of the environment;
   - conserving the soil and combating, where needed, decertification;
   - preventing deforestation and promoting afforestation;
   - recycling materials and promoting low or non-waste technologies;
   - developing renewable sources of energy, and
   - investing in infrastructure (including habitat, sanitation, and collective transport).

6. There should be established a National Environmental Commission or Consultative Body comprising the National Environment and Human Settlements Secretariat, FKE, COTU and other interested parties to advise the Government on the general and working environment.

7. There should be a revision, up-dating and consolidation of legislation relating to both the general and working environment with a view to facilitating their implementation and enforcement, through the enactment of an Environmental Protection Act.

The working environment

1. Occupational safety and health should be dealt with as an absolute priority, the aim being to prevent accidents and occupational diseases.

2. Health and safety considerations should be regarded as a natural part of the daily and normal production activities, on an equal footing with wages and financial, technological, marketing and product development considerations.

3. Prevention measures should be taken with respect to the harmful effects of poor environmental conditions, particularly through the monitoring of both the general and working environment, the establishment of health-based exposure limits related to such environmental conditions, the possible installation of the best control technology including certified protective equipment and devices, and the regular supervision of workers health.

4. Needs should be identified primarily at the shop-floor level. Functional programmes should be developed to meet the needs. Such programmes should be specific, practical, action-oriented, focusing on well-defined objectives, as specified in ILO Recommendation No. 164 concerning Occupational Safety and Health and the Working Environment, which indicates the organizational steps to be taken by the employers in this area. They should include workers involvement, in particular through the appointment, where appropriate and, in accordance with Kenyan practice, of workers' safety delegates, and safety committees.

5. Remembering that prevention is better than cure, requirements relating to occupational safety and health as well as working and living conditions, should be considered at the planning and design stage, in feasibility studies, investment plans and equipment specifications.

6. Whilst the primary responsibility for control of the hazards arising out of current, new or transferred technologies rests with management, co-operation between government, employers and workers should be developed in order to prevent or minimize the possible negative effects of such technologies.

7. For employers as well as workers, there is a need for practical programmes of information, education and training in occupational safety and health, as well as on working and living conditions. Such programmes should include all essential elements of industrial hygiene, accident prevention and general environmental problems, including induction and training of new employees.

8. Since occupational health and safety standards are not given once and for all but must correspond to the development in industry at any time, training should be recurrent and not a one-time exercise.

9. The interrelationship between working and living environment should be closely assessed in order to evolve policies and action programmes as well as improve the workers' quality of life.

10. Health and safety expenditure should be considered as an integral part of production costs, regard being given to the interrelationship between a good working environment and productivity.

11. The Federation of Kenya Employers should, as far as possible, assist its members in implementing the proceeding paragraphs. Future Seminars should include industrial waste disposal, fire safety, public health and other related subjects.

12. The Factories Inspectorate in Kenya should be expanded and be strengthened to include a wider category of staff e.g. nurses, public health officers, chemical engineers, statisticians and laboratory staff. The Inspectorate should be well equipped to enable it to monitor and control the working environment.

(pp 10-13, FKE Newsletter No. 191, 27th February, 1987).

BURKINA FASO

Hubert Ouedraogo

ABSTRACT

The industrial sector is not well developed developed in Burkina Faso. It has approximately 84 small and medium-scale enterprises representing the mining industry, the food and tobacco processing industry, the leather and textile industry, the wood processing industry, the printing industry, the chemical industry, and the manufacturing of metallic products. These industries are largely oriented towards the processing of agricultural and forest products. They are mostly located in five urban industrial zones; two of which are in Ouagadougou. Mineral resources are under-exploited and mining activities not well developed.

Pollution is still considered a minor problem in Burkina Faso, in comparison to drought and poverty alleviation. However, the increase in urban construction activities and the development of mineral extraction industries have compelled the public authorities to take more and more measures to combat the environmental consequences of industrial activities. As an example, a more comprehensive law was adopted in 1997, replacing the Investment Code of September 1995 which was deemed not attractive to investors.

Water pollution by industries is more seriously experienced in urban areas, particularly in Bobo Dioulasso. In 1996, the Directorate of Environment received a complaint from the riparian population of the Kou River because the watercourse was very much polluted; it was no longer fit for human consumption due to dangerous effluents released from two factories.

Many legal and regulatory instruments define the policy basis for environmental management concerning pollution. One can quote the Environment Code of 30 June 1997, the Law on the Reorganization of Land and Agriculture of 23 May 1996 and its implementing decree of 6th February 1997, the Health Code of 1994 and the Order of 1975 relating to the management of hazardous installations.

The Environment Code establishes the principle of impact assessments, which corresponds to the principle of prevention and sustainable development. It also has provisions on waste management and air pollution control.

So far, pollution by industries is not a major concern in the country level. However, preventive measures are required through a more comprehensive policy which would involve information dissemination, the intervention of the judiciary, the promotion of administrative measures, and the control and monitoring of existing trends in pollution.

INDUSTRIE ET ENVIRONNEMENT AU BURKINA FASO

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1. INTRODUCTION

Le secteur industriel burkinable est relativement embryonnaire. La politique industrielle du gouvernement vise principalement à soutenir en amont et en aval le secteur agricole considéré comme secteur prioritaire (production d'quipements; fourniture d'intrants; transformation des produits agricoles et pastoraux). Les activités des unités industrielles existantes sont actuellement orientées vers la transformation des produits agricoles (CITEC: production d'huile et savon à partir des arachides et des amandes de karité; SAVANA: transformation des fruits et légumes pour la production de jus de fruits, de concentre de tomates et de confitures; diverses scieries: valorisation du bois local et la SOFITEW).

Avec plus de 22% de son territoire riche en substances minérales, le Burkina Faso aurait pu trouver dans le secteur minier un véritable pôle de développement économique. Mais les ressources minières sont restées longtemps sous-exploitées. Jusqu'aux années 80, l'industrie extractive ne représentait qu'une valeur insignifiante dans la formation du PIB. Le faible développement de l'exploitation minière s'explique par diverses contraintes (faibles capacités d'investissement du pays, situation d'enclavement, cadre législatif et institutionnel peu incitatif ...). Les activités d'exploitation minière concernent principalement aujourd'hui l'or, le phosphate et plus récemment le manganèse.

Faul-il se préoccuper des problèmes de pollution liés à l'industrialisation dans un pays pauvre, et principalement agricole? Une certaine opinion longtemps dominante a consisté à considérer que se préoccuper des pollutions industrielles était un luxe que ne povait s'offrir les pays africains, surtout ceux sahéliens. Cette opinion se fondait sur plusieurs argumetns dont les principaux sont les suivants:

- les problèmes de pollution ne concernent pas des pays sous-industrialisés comme le Burkina; ils concernent prioritairement les pays développés du Nord;
- quand bien même les pays africains voudraient prendre des mesures de préservation des pollutions industrielles ils ne le pourraient pas car le mise en oeuvre de ces mesures coûtent très cher.
- la pollution est un moindre mal par rapport aux bénéfices de l'industrialisation et par rapport aux autres maux tels que le sécheresse, la pauvreté...

Pourtant l'accélération de phénomène d'urbanisation, les progrès rapides de l'industrie extractive, ainsi que les graves nuisances produites par les quelques entreprises industrielles existantes (odeurs, fumées ...) conduiront tant les pouvoire publiee que le société civile à se préoccuper de plus en plus des conséquences environnementales des activités industrielles.

2. LE PAYSAGE INDUSTRIEL BURKIANBLE ET LES PROBLÈMES DE POLLUTION

2.1 Un tissu industriel embryonnaire ...

Le tissu industriel burkinable regroup aujourd'hui 84 entreprises que l'on peut regrouper dans les branches ci-après: 1 - extraction et mines; 2 - produits alimentaires et tabacs: 3 - textiles et cuir; 4 - industrie du bois; 5 - imprimeries; 6 - industries chimiques; 7 - fabrication et ouvrages métalliques.

L'industrie burkinable est dominée par la branche des produits alimentaires.

Les industries sont regroupées dans cinq zone industrielles situées à la périphérie des villes, les deux principales étant situées à Ouagada.

Les activités d'exploitation minière concernent principalement l'or le phosphate et plus récemment le manganèse. L'exploitation industrielle se résume à une seule unité exploitant la mine d'or de Poura. Le reste de l'exploitation minière et semi-industrielle et surtout artisanale (orpaillage).

Au plan économique le sunités industrielles contribuent seulement à hauteru de 17% au PIB.

2.2. .... mais des problèmes environnementaux préoccupants

Malgré ce faible développement du secteur industriel, le Burkina connaît de sérieux problèmes de pollution. Cette situation paradoxale peut être rattachée aux options politiques en matière d'industrialisation. Les autorités gouvernementales ont en effet toujours adopté une politique attractive des capitaux tant intérieurs qu'extérieurs dans le secteur industriel en vue notamment de favoriser la création d'emplois. La politique d'attrait des capitaux dans le secteur industriel s'exprime notamment à travers la promulgation et l'adaptation constante d'un code des investissement très la promulgation et l'adaptation constante d'un code des investissement très libéral (loi n 15/97/AN, modifiant la loi n 62/95/ADP du 14 Septembre 1995 portant codes des investissements). Ainsi, les investisseurs intervenant dans certains secteurs industriels bénéficient d'un régime privilégié (exemption de droits de douane, et d'impôt sur les bénéfices pendant une durée déterminée...).

Ce souci d'attirer les capitaux amène les autorités à ne pas toujoiurs prêter une attention suffisante aux risques environnementaux qu'impliquent la plupart des activités industrielles.

Aujoud'hui, la plupart des unités industrielles mènent leurs activités sans mesures conséquentes de protection de l'environnement et de minimisation des nuisances. C'est ainsi que les déchets industriels sont déversés dans les cours d'eau, à la périphérie des villes provoquant des dégâts sur les ressources halieutiques (cas des poissons sacrés du Houet), les végétaux et même les hommes. Des fumées et odeurs incommodantes sont déversées dans l'atmosphère par des entreprises qui ne sont pas toujours installées dans les sites appropriées.

Dans la ville de Bobo-Dioulasso, la pollution des eaux par les rejets industriels est un problème serieux, Régulièrment, les cours d'eaux sont pollués par les rejets des unités industrielles.

Lors de la construction de la plupart des usines de la ville aucune mesure appropriée n'a été prévue pour assurer le traitement des eaux usées.

En octobre 1996, la direction régionale de l'environnement fut saisie par les populations riveraines du Kou pour se plaindre de la grave pollution dans la nuit du 3 au 4, de la rivière KOU. L'eau de la rivière était devenue totalement impropre à la consommation alors que la plupart des populations rurales qui ne dispose par d'adduction d'eau potable, et s'alimentait directement à la rivière ou dans les puits avoisinants.

Les constats effectués par la direction de l'environnement donnent les résultats suivants: eaux noirâtres et moussantes; odeur de savon ressentie à plus de 200 mètres; des poissons et crocodiles retrouvés morts; végétation brûlée; des animaux domestiques présentant des signes de malaise; des cas de brûlure de la peau au contact de l'eau signalés; pénurie d'eau potable dans plusieurs villages.

La pollution résultait de la rupture de la digue du bassin de rétention des eaux usées, réalisé dans une ancienne carrière proche de la rivière, et destiné à recevoir les eaux usées de 2 usines. Des faits de pollution santérieures

peuvent être signalés, notamment en septembre 1995, et même en septembre 1997. Mais la pollution la plus grave fut celle du mois d'octobre 97. On ne connaît pas encore l'ampleur des dégats causés à l'environnement et aux populations riveraines.

De nombreaux autres cas de pollution peuvent être relevés dans les différents sites industriels, touchant notamment la pollution des nappes phréatiques et la destruction de la végétation par le rejet par les unités industrielles des eaux et huiles usées, la production de fumées et d'odeurs incommodantes dans certains quartiers d'habitation ...

Les prélèvements faits cette année dans la rivière Massili, qui reçoit les eaux usées de certaines unités industrielles ont révélé que les valeurs obtenues dépassent de loin les normes admises par l'OMS. Dans le cas examiné, il a été relevé que les eaux résiduaires s'écoulant d'une unité industrielle contaminaient les eaux de consommation par infiltration, on par immersion de certains puits mal protégés pendant la saison pluvieuse. On en a conclu que l'eau de consommation dans le vilalge ciblé était impropre à la consommaiton.

3. LA LÉGISLATION RELATIVE AUX POLLUTIONS ET NUISANCES

Plusieurs textes législatifs et réglementaires donnent des outils permettant de définir une politique de lutte contre les pollutions résultant des activités industrielles. On citera notamment:

- la loi n 05/97/ADP du 30/01/97 portant code de l'environnement - la loi n 14-96/ADP du 23 mai 1996 portant Réorganisation Agraire et Foncière et son décret d'application n 97-054/PRE/SPM/MEF du 6 février 1997
- la loi n 23/94/ADP du 19 mai 1994 portant code de la Santé publique
- Arrêté n 000429/MC DIM/DGM du 8 mars 1975 sur les établissements dangereux.

On se contentera ici de rappeler les principes esentiels posés par le code de l'environnement.

3.1- Dispositions relatives aux études d'impact sur l'environnement

La procédure de l'étude d'impact correspond à la mise en oeuvre du principe fondamental de prévention et traduit l'intégration dans la politique environnementale de l'idée très actuelle du développement durable. Le code de l'environnement établit une distinction entre étude d'impact environnemental et notice d'impact enviornnemental. L'étude et la notice d'impact sur l'Environnement doivent permettre de cerner la difference entre l'environnement futur modifié tel qu'il résultera de l'exécution d'une activité et l'environnement futur tel qu'il aurait évolué normalement sans la réalisation de ladite activité

Aux termes de l'article 5 alinéas 4 et 5 du code de l'Environnement, "l'étude d'impact sur l'environnement est une étude à caractère analytique et propsectif aux fins de l'identification et de l'évaluation des incidences d'un projet sur l'environnement". En revanche, la "notice d'impact sur l'environnement est une étude d'impact simplifiée". Toutefois, elle répond aux mêmes préoccupations que l'étude d'impact et comporte des indications sérieuses.

A. Champ d'application de l'étude d'impact

De la combinaison des articles 17 et 20 du code de l'environnement, sont soumises à l'avis préalable du Ministre chargé de l'Environnement, les activités susceptibles d'avoir des incidences significatives sur l'environnement; cet avis est établi sur la base d'une étude d'impact sur l'environnement ou d'une notice d'impact sur l'environnement qui est soumise à l'examen d'un cadre de concertation visé à l'article 7 du code de l'environnement. Cette structure de concertation, d'orientation, de suivi et d'évaluation.

Un décret pris en conseil des Ministres sur proposition du Ministre chargé de l'Environnement établit et révise la liste des travaux, ouvrages, aménagements et activités ainsi que les documents de planificaiton assujettis à l'étude ou à la notice d'impact sur l'environnement.

B- Elaboration et contenu de l'étude d'impact

L'article 21 du code de l'envrionnement dispose que tout promoteur peut avoir recours à une expertise de son choix pour effectuer l'étude ou la notion d'impact dont les resultats font l'objet d'un rapport. Le financement de l'étude ou de la notice d'impact est entièrement à la charge du promoteur.

Le code de l'environnement n'a cependant pas défini le contenu de l'étude d'impact et de la

notice d'impact qui devra être précisé par décret prise en conseil de ministres sur proprositon du Ministre de l'Environnement. Enfin, l'étude d'impact sur l'environnement doit être complété par une enquête publique dont le but est de recueillir les avis et les contrepropositions des parties concernées par rapport à l'étude d'impact sur l'emvironnement qui leur est prsenté (article 19).

La nécessité de l'étude d'impact préalable sur l'environnement a été affirmée par plusieurs autres textes législatifs. Il en est ainsi de la loi n 06/97/ADP du 31 janvier 97 portant code forestier et du projet de loi portant code minier ou de la loi n 14-96/ADP du 23 mai 1996 portant Réorganisation Agraire et Foncière.

De tout ce qui précède, il apparaît clairement que la procédure des études et notices d'impact sur l'environnement dépend en grande partie des modalités pratiques de mise en oeuvre et cette efficacité ne pourra être appréciée qu'a l'usage.

3.2 - Dispositions relatives aux déchets dangereux

Le code de l'environnement prévoit la réglementation des déchets dangereux. Les déchets industriels ou assimilés sont réputés dangereux des lors qu'ils présentent une menace ou un danger quelconque pour la santé ou la sécurité publique ou pour l'environnement. Les établissements dangereux, insalubres et incommodes sont classés en trois classes selon le degré de risques qu'ils présentent pour la populaiton et l'environnement. Les établissements de première classe sont ceux qui, de par leur nature, doivent être obligatoirement éloignés des habitations. Les établissements de deuxième classe sont ceux dont l'éloignement des habitations n'est pas rigoureusement nécessaire, mais dont l'exploitation ne peut être autorisée qu'à la condition que des mesures soient prises pour prevenir les dangers ou les incommodités.

Les établissements de la lère et de la 2ème classe sont soumis à un chaier des charges général (non encore élaboré) qui doit préciser les conditons générales d'élimination des déchets industriels, ainsi que les conditoins d'hygiène et de sécurité.

Il faut noter, à côté de ce cahier des charges général, l'existence d'un chaier des charges sectoriel qui précise les conditons matérielles et les techniques de stockage, de traitement, de recyclage, de transport et d'élimination des déchets industriels et assimilés.

Enfin, des cahiers des charges spécifiques prenant en compte les préoccupations particulières des localités peuvent être élaborés par les collectivités territoriales décentralisées sous réserve du respect des textes en vigueur en relation avec les services techniques compétents.

3.3- Dispositions relatives aux pollutions atmospheriques

Selon les dispositoins de l'article 5 alinéa 12 de la loi du 05/97/ADP du 30 janvier 1997 portant code de l'environnement, les pollutions atmosphériques se caractérisent par:

- la présence dans l'air ambiant de substances ou particules qui, de par leurs aspects, leurs concentrations, leurs odeurs ou leurs effets physiologiques, portent préjudice à la santé et à la sécurité publique ou à l'environnement;

- la présence dans l'atmosphère de substances contribuant notamment à l'effet de serre et à la réduction de la couche d'ozone.

Les dispositoins de loi portant code de l'environnement et relatives à la lutte contre le pollutions atmosphériques couvrent un champ d'application très large. Pratiquement toutes les sources de pollution atmosphériques sont visées par l'article 46 de la loi.

Ainsi, les immeubles, établissements industriels, commerciaux, artisanaux et agricoles, les mines et carrières, les véhicules ou autres objets mobiliers possédés, exploités ou détenus par toute personne physique ou morale, doivent être construits, exploités ou utilisés de manière à satisfaire aux disposition sprises en application du présent code afin d'éviter la pollution de l'atmosphère et les odeurs qui incommodent la population, compromettent la santé, la sécurité publique ou nuisent à la production agricole et animale, à la conservation des sites et monuments.

Ces prescriptions doivent faire l'objet de décrets pris en conseil de ministres sur propositon des ministres compétents.

Comme on le constate à travers ces prescriptions, les dispositions concernant la lutte contre les pollutions atmosphériques ne sont pas

sans lien avec celles relatives aux établissements dangereux, insalubres et incommodes, à la construction, au code de la route.

Les véritables contraintes à la lutte contre les pollutions atmosphériques sont essentiellement d'ordre institutionnel, technique et financier.

Au niveau institutionnel, il n'existe pas encore de centre de compétences et de coordiantion pour proposer et gérer des actions concertées entre le différents services de l'Etat.

La création d'un centre pour la proteciton de l'air sous tutelle du Ministrère de l'Environnement et de l'Eau permettrait de combler ce vide institutionnel.

Au niveau technique, il n'existe par d'unités de mesures pour contrôler le niveau de pollution de l'air et les structures intervenant directement ou indirectement (Centre de Contrôle des Véhicules Automobiles (CCVA), Direction de la météorologie, Direction de la Prévention des Pollutions et de l'Assainissement) sont sous équipés ou pas du tout.

Enfin, les solutions techniques pour lutter contre la pollution de l'air engendrent généralement des coûts très élevés pour l'Etat et le secteur privé.

4- PERSPECTIVE: QUELLE POLITIQUE DE LUTTE CONTRE LES POLLUTIONS INDUSTRIELLES.

La lutte contre les pollutions industrielles comme on peut le constater est loin d'être un risque pour un pays comme le Burkina. Si les problèmes enviornnementaux sont nombreaux avec un si petit nombre d'unités industrielles, on peut craindre qu'ils ne se multiplient de manière exponentialle avec les progrès prévisibles de l'industrialisation.

En matière environnementale l'adage "mieux vaut prévenir que guérir prend tout son sens. Il faut donc entreprendre des mesures de préservation de l'environnement pendant que les problèmes ont encore maîtrisables. La politique de prevention des pollution doit être accompagnée d'un suivi et d'une mise en oeuvre de la législation. Dans tous les cas, il est nécessaire de tenir compte du contexte local et chercher moins à placer les entreprises dans une positon d'accusés, que de les impliquer dans la préservaiton de l'environnement.

4.1 - La prévention: information et études d'impact environnemental

L'information des industriels sur les risques graves qu'ils font courir à la population, ainsi que sur les sanctions auxquelles ils s'exposent est une exigence première en matière de lutte contre les pollutions. Cette information doit être également destinée aux populations, notamment celles les plus exposées. Une action soutenue d'ionformation permettra de créer une conscience nouvelle de l'ensemble des aacteurs aux préoccupations enviornnementales.

La mise en oeuvre des études d'impact enviornnemental apparaît ensuite comme une mesure urgente à mettre en oeuvre, notamment poour les futures entreprises industrielles qui souhaiteraient s'installer. La mise en oeuvre effective des dispositons relatives aux études d'impact suppose que soient élaborés les textes d'application pertinents. Le sous-projet législation et institution de l'environnement s'y atèle en collaboration étroite avec le Ministère chargé de l 'environnement.

La question à résoudre est cependant celle du finacement des études. A ce niveau il faut faire une application judicieuse de la distinction entre étude d'impact et notice d'impact, en n'utilisant la première, plus coûteuse, que pour les très grands travaux. On pourrait conditionner également l'obtention du régime privilégié du code des investissement celles ayant réalisé une étude d'impact sur l'environnement. Enfin une voie à explorer est celle de la subvention partielle aux entreprises à travers les fonds environnementaux en vigueur.

4.2- L'intervention des institutions judiciaires

Le code de l'environnement prévoit des sanctions tant civiles (principe du pollueur payeur) que pénales (amendes, emprisonnement) à l'encontre des auteurs d'infractions enviornnementales. Il revient aux institutions judiciaires d'appliquer rigoureusement la loi. Dans ce cadre la société civile (assocations de droit de l'environnement, associations villageoises, individus) doit être active en engageant la responsabilité civile des industriels pollueurs: l'éventualité du paiement de dommages et intérêt pourrait conduire à être plus attentives aux questions environnementales. Le juge devrait mettre en avant la pression à exercer sur l'industriel pour l'obliger à prendre les mesures appropriées. Ainsi, une condamnation sous astreinte à réaliser les

aménagements prévus par la loi serait de nature dissuasive contre les attitudes e négligence trop souvent observées.

La manifestation de la volonté politique de l'Etat reste malgre tout est essentielle afin de mettre en oeuvre l'action publique, en vue d'aboutir dans les cas graves à l'application des sanctions pénales.

L'intervention judiciaire peut être complété par des mesures administratives telles que fermetures temporaires.

4.3. LA POLITIQUE DE SURVEILLANCE DE L'ENVIRONNEMENT INDUSTRIELLE

Le Ministère chargé de l'environnement a initié une réflextion sur la mise en oeuvre d'un politique de surveillance de l'environnement industriel à travers la Direction de la préservation de l'environnement. Cette politique vise la protection de la santé de l'homme, la préservation de la qualité de l'air, de l'eau du sol, la proteciton des animaux et des végétaux. Elle consiste:

- au recueil des données et informations enviornnementales sur les unités industrielles (fiches d'enquête à adresser à chaque unité indistrielle contrôles techniques sur place.

- à l'analyse et à la validation de sdonnées recueillies.

Ces informations permettront de mieux connaître la situation spécifique de chaque entreprise, d'élaborer des scénarios de préservation, et de déterminer les mesures correctives, préventives et compensatrices nécessaires.

EXPORT PROCESSING ZONES AUTHORITY

Maria Ouya

Corporate Secretary, EPZA

1. INTRODUCTION

The Export Processing Zone programme was established by the enactment of the Export Processing Zone Act (Cap 517) which also provides for the establishment of other Export Processing Zones, promotion and facilitation of export oriented investments and the development of an enabling environment for such activities.

The Act recognizes environmental concerns and empowers the Export Processing Zones Authority (EPZA) to decline issuing licenses to enterprises whose activities are likely to have a deleterious impact on the environment, or which engage in unlawful activities impinging on national security, or which may prove to be a health hazard (See section 23 (2) (c) of the EPZ Act Cap 517). All environmental guidelines and standards spelt out in the existing laws apply to enterprises which operate in the Zones.

EPZA recognizes environmental control as an important part of its monitoring of industrial activities in the zone. It has its own environmental standards and requirements to protect the environment from hazards of industrial operations. These are implemented by the Operations Department.

The Department carries out monthly visits to assess working conditions and health and safety at the work place. Typical reports cover fire preparedness, staff welfare and general working conditions with recommendations for implementation.

2. CONTROL OF INDUSTRIAL POLLUTION

EPZA has adopted a policy of source control in which operations are required to be conducted in an environmentally sound manner. New industrial projects are examined in detail from the outset to determine potential environmental impact and to enable EPZA specify remedies at design stage. This also ensures that environmental impacts are taken into account by all decision makers throughout the entire life circle of the project.

2.1 Zone Development: Athi River EPZ

In the development of the Athi River site the objective was to have an environment of high visual quality so that it acts as a "show piece" for Kenya.

Environmental concerns were key considerations in the physical design of the Athi River Zone as follows:-

Physical Design

Land use patterns were defined, infrastructure services, population growth, existing industries and proximity to the national park to plan for preservation and conservation of migratory routes of wildlife, to enhance wildlife management, green belts and woodlands.

Housing

Housing was also planned near industry to minimize cost to industry.

Zone Concept

The zone concept, providing for an industry/ residential town, gave a lot of consideration to maintaining an ecological balance suitable to human life and nature with provisions for:

- game corridors, green belts and park lands
- plans envisaged development of a dynamic growth center which will respond to the

process of growth

- an urban form and arrangement for activity areas of industry, residence, civic and social activity and recreation.

Physical Site

- the site has well drained gentle slopes
- its design has respected natural features - topography and natural drainage
- steep slopes along valleys have been planted and landscaped to provide recreational areas to enhance the environment in the zone.

Facilities

The Zone, in addition to factory buildings and serviced land, has an administration center, health center and fire station.

Sub-division

Industrial plots have a flexible layout scheme to form a larger plot or be sub-divided into smaller plots.

Roads

Generous road reserves and carriage ways much wider than in normal urban development have been provided to be able to deal with heavy traffic.

Land utilization

Of the total area, 217 hectares are set aside for industrial sites, 284 hectares for the administration block, gate-house, car park and open space and 46.2 hectares for roads, walkways and drains.

Surface water drainage

Drains have been provided at lower ends of plots to ensure economical drainage. In addition there are road side drains, culverts and out-fall drains.

Foul Sewage

As part of the provision for both EPZ industries and existing Athi River town requirements, a 16 km sewer-line and sewage treatment works was constructed. The facilities comprise on-site sewer reticulation, Trunk Sewer and treatment works.

Environmental standards for Athi River Zone together with Building Guidelines and procedures are attached.

ATHI RIVER EXPORT PROCESSING ZONE
ENVIRONMENTAL STANDARDS

1. INTRODUCTION

The Export Processing Zones Authority (EPZA) has developed an EPZ at Athi River. The first phase of the site is approximately 96 Hactares. of fully serviced industrial plots and factory buildings. Environmental standards outlined below have been formulated so as to protect and maintain an acceptable quality of environment for Phase I as well as for the total industrial site measuring 225 Hactares.

2. ENVIRONMENTAL STANDARDS

In order to ensure that appropriate measures are put in place for the preservation and protection of the environment, industrialists are required to comply with standards set by Export Processing Zones Authority for trade effluent discharged to sewers, solid waste disposal, emissions to the atmosphere (air) and for the working environment. In general, manufacturers are required to ensure that their activities do not result in adverse effects on the environment.

2.1 Trade Effluent Standards

2.1.1General

All applications for enterprise licenses are required to supply adequate information on the sources of all effluents, whether the effluent will meet discharge standards, and if not, how the effluent will be pre-treated so as to comply with the standards. Where prohibited toxic substances will arise from any of the manufacturing processes, applicants should provide information as to their complete removal and safe disposal prior to discharge of effluent to the sewer and adequate arrangements for regular monitoring to ensure that no spillage or unauthorized discharge occurs. Once the operation has been established every manufacturer shall maintain records of regular analysis of their effluent and provide access to EPZA staff to inspect effluent sources and discharge points to ensure compliance with these standards. EPZA reserves the right to take effluent samples for analysis as and when it deems appropriate.

2.1.2 Effluent Standards

Effluents shall not exceed the values or concentrations stated below:-

(1)	PH should range between	5.5-9.0
(2)	BOD5 at 200C should not exceed	500 mg/1
(3)	COD should not exceed	1000mg/1
(4)	Temperature at entry to sewer should not exceed	400C
(5)	Suspended solids should not exceed	600mg/1
(6)	Oil/grease should not exceed	20mg/1
(7)	Ammoniacal nitrogen should not exceed	50mg/1
(8)	Total kjedahl nitrogen (TKN) should be	Nil
(9)	Total nitrate-nitrogen should not exceed	20mg/1
(10)	Free Ammonia (NH3) should not exceed	10mg/1
(11)	Total dissolved solids should not exceed	2000mg/1

(12)	Chloride as CI should not exceed	600mg/1
(13)	Dissolved phosphates should not exceed	30mg/1
(14)	Sulphates (SO2) should not exceed	1000mg/1
(15)	Sulphide (S) should not exceed	5mg/1
(16)	Phenol should not exceed	5.0mg/1
(17)	Nickel should not exceed	1.0mg/1
(18)	Zinc should not exceed	50mg/1
(19)	Hexavelant Chromium (Cr6) should not exceed	0.05mg/1
(20)	Lead (Pb) should not exceed	1.0mg/1
(21)	Copper (Cu) should not exceed	1.0mg/1
(22)	Total Chromium should not exceed	1.0mg/1
(23)	Pesticides should not exceed	Nil
(24)	Detergents should not exceed	15mg/1
(25)	Other toxic metals in combination or singularly (except iron) should not exceed	1.0mg/1

2.2 *List of Prohibited Substances*

The following substances, which are toxic and dangerous to the environment, treatment process and maintenance staff, are prohibited for discharge into the sewer:-

1.	Arsenic:	Arsenic Compounds
2.	Mercury:	Mercury Compounds
3.	Cadmium:	Cadmium Compounds
4.	Thallium:	Thallium Compounds
5.	Beryllium:	Beryllium Compounds
6.	Chrome:	6 Compounds
7.	Lead:	Lead Compounds
8.	Antimony:	Antimony Compounds
9.	Phenols:	Phenol Compounds
10.	Cyanides:	Organic and Inorganic
11.	Isocyanates	
12.	Organic halogen Compounds, excluding inert Polymeric materials and substances referred to in this list or covered by other Directives concerning the disposal of toxic or dangerous waste.	
13.	Chlorinated Solvents	
14.	Organic solvents	

CERES - INDUSTRIAS ALIMENTARES, LDA- MOZAMBIQUE

Ms Maria Helena Sitoe
Ceres Industrias Alimentares, LDA

1. INTRODUCTION

I am pleased to be given this opportunity to speak about industry and the environment. On behalf of Mozambique industry, I would like to thank you all for your direct support to this event.

This Workshop shows that there is necessity for solidarity and co-operation among the people in the struggle against the accelerated destruction of the environment and to find viable ways to protect it.

Mankind needs the available scarce natural resources for survival.

The problems of misuse of the natural resources and pollution are taking alarming proportions in Africa, putting at risk the life of humans and animal species.

What can be done? What is being done to avoid this catastrophe?. What is the perception of African industry about the environment? These are a few questions that this event needs to tackle.

The society (population, enterprises and the government) are called upon to give their contribution to the solution of this problem.

2. THE IMPACT OF THE MOZAMBIQUE INDUSTRY ON THE ENVIRONMENT

The degree of industrialization in Mozambique is very low with low levels of production and the use of obsolete technology. That is why environmental problems are not yet severe in comparison with other developed countries'.

To regulate this "small problem" demands rapid intervention since an evaluation of the impact of the problem has never been done in a systematic way in order to obtain a clear picture of the its extent. We should not wait for the environmental degradation to grow to the stage that it has in the developed countries, otherwise we will not be able to set up preventive mechanisms.

In this context, the Mozambican government should implement the environment principles adopted by the United Nations through sensitization and information which can facilitate the preservation and protection of the environment.

The preservation of the environment is not the exclusive task of the government. It constitutes a duty of the whole society.

The globalization of the economy demands new strategies and methods of management in order to make enterprises capable of facing market demands, and a strategic vision of the future in order to face the new challenges. Therefore, Ceres has not been inattentive to the environmental changes.

What is the role of Ceres in the programme of environmental management?

CERES, INDUSTRIAS ALIMENTARES, LDA is a private owned company, in the food industry situated in Matola, Mozambique. It was founded 30 years ago producing pasta and biscuits. The production is mechanized and it has about 262 workers. For the manufacturing of the above products it uses the following raw material: white flour, sugar, flavourings, corrugated cardboard and plastic packing, electric power, fuel gas (propano marine diesel).

3. THE ENVIRONMENTAL IMPACT OF THE PETROLIPHERONS PRODUCTS USED AT CERES

The petrolipherons products used at Ceres release gases that are adverse to the atmosphere especially the composed hydrogenated sulphurous hydrocarbons and other particles in significant quantities.

Although in Mozambique there is no capacity to calculate exactly the level of industrial pollution, the toxicity of petroleum and its derivatives is well known.

The company does not have an Environment Section to deal specifically with environmental issues, but it carries out various activities which aim to reduce costs, increase production and improve quality at all levels.

Although the company has no financial resources to make new investments there is a lot of effort to train the staff in quality environmental management according to acceptable internationally methods. This is done through short term course and seminars to the promotion of workshop hygiene and security.

The aim of this is to train the staff about the dangers to the environment, the care to be taken in the handling of materials, and to familiarize them with the application of available methods of environmental protection and finally to strengthen their relationship with the recycling industry for corrugated cardboard and paper.

The treatment of gaseous effluent and other pollutants demands high levels of investment which exceed the economic capacity of the company.

The government should create incentives for the private sector through customs benefits (exemption on customs duty on all material needed to implement new environmental projects, with increased support for mechanisms for achieving compliance with environmental law).

SUMMARY OF THE SOUTH AFRICAN MINING INDUSTRY AND RELATED ENVIRONMENTAL INITIATIVES

J L McCourt
Technical Assistant, Environment Chamber of Mines of South Africa

1. INTRODUCTION

This document has been produced in response to the request by UNEP to prepare a brief presentation regarding the questions outlined in the background document for the workshop. A detailed discussion document has been prepared as well, and is available on request. The questions posed are repeated below for ease of reference.

2. HAS THE INDUSTRY/ ORGANIZATION ESTABLISHED AN ENVIRONMENTAL UNIT?

The Chamber of Mines (COM) is an organization whose members comprise a number of the mining houses currently operating in South Africa. The Chamber has an Environmental Policy Committee that co-ordinates the environmental policy initiatives of its members. The current trend is for individual mining houses to establish their own environmental units as well. Certain companies also collaborate in environmental management by establishing joint committees to co-ordinate environmental management within the groups. The head of the environmental unit of each group is a member of the Chamber's Environmental Policy Committee.

Other than the COM, certain mining sectors such as the Sand and Aggregate Producers have established Associations to co-ordinate their activities, including in respect of environmental matters.

3. WHAT IS THE FUNCTION OF THE UNIT?

The COM has various responsibilities and functions relating to mining and environmental issues. These include

- Provision of an advisory service to its members on environmental management, technology and pressures. The COM also acts as a lobby group for mining and presents the position of its members on policy initiatives and the development of legislation in appropriate fora.
- The COM has historically been involved in the development of re-vegetation and rehabilitation techniques for residue deposits and areas disturbed by mining operations. This section of the COM is now a wholly independent subsidiary company.
- The COM Research Organization (COMRO) is involved in research and development projects pertaining to technological requirements in the mining industry. Such advances include developments in the environmental technology field.

4. WHAT STEPS IS THE INDUSTRY/ ORGANIZATION INVOLVED IN TO DEVELOP CONSERVATION TECHNOLOGY WHICH REDUCES WASTES AND INCREASES PRODUCTION OF MARKETABLE GOODS?

Efforts by the mining industry to achieve the above objective include policy and technology initiatives, some of which are summarized below.

- Involvement in policy development initiatives such as that of Integrated Pollution Control, and the National Waste Management Strategy for South Africa.
- Many mining houses are currently involved in the reclamation of previously economically marginal mine dumps, especially in the gold mining industry. This reduces waste volumes, frees up land for development purposes and results in increased gold production.
- The mining industry has developed technology to optimize use of process water. This treatment of water allows for re-use of water and, consequently, a lowering of raw water consumption. It also lowers the volume of contaminated water to be discharged.
- The development of desalination technology processes facilitate re-use of the scarce water resources of South Africa.

5. WHAT STEPS HAS THE COMPANY TAKEN TO PREVENT POLLUTION OF THE ENVIRONMENT?

- Involvement in policy initiatives to reduce and control pollution and rationalize its management.
- Involvement in the formulation and revision of legislation pertaining to the mining industry (the Minerals Act 50 of 1991), and environmental legislation (the Environment Conservation Act 73 of 1989, regulations promulgated under this Act in 1997, and the ongoing revision of the Water Act 1956).
- Technological developments to allow the re-use and recycling of water, such as desalination technology, water treatment for the removal of potentially harmful elements (such as iron oxides), improved water recovery technologies in the slurring processes.
- Support for research projects on treatment approaches for mine water effluent.
- Development of world renowned rehabilitation and re-vegetation techniques.
- Development of best practice guidelines (Chamber of Mines guidelines and the Code of Practice for Mine Residue Deposits)
- Support for research into the development of alternative refrigerant sources and optimum use of existing CFC stockpiles.
- Support for research into the development of low smoke fuels.

6. WHAT RECOMMENDATIONS WOULD THE INDUSTRY WISH TO MAKE FOR THE PROMOTION OF CLEANER PRODUCTION?

- Support for and realization of the policy initiatives mentioned above, such as IPC and the National Waste Management Strategy
- Support of research into cleaner technology such as that for CFC's, water and ore-processing methodologies
- Promoting the principle that cleaner production is not an end in itself but promotes good business initiatives that make economic sense.

BUILDING PARTNERSHIP WITH INDUSTRIES AND MANUFACTURERS ON COMPLIANCE WITH AND ENFORCEMENT OF ENVIRONMENTAL LAW

Peter Orawo
Kenya Association of Manufacturers

1. INTRODUCTION

The Kenya Association of Manufacturers (KAM) is a representative organization of industrialists in Kenya. It was constituted as an East African organization as a corporate body in 1959. Its major aim was to unite the industrialists in a powerful organization to encourage investment and develop the industrial potential of East Africa i.e. Kenya Uganda and Tanganyika (now Tanzania). KAM became a Kenyan organization in 1970.

KAM advises industrialists and potential industrialists on many issues. The Energy and Environmental division of KAM is very young. It was started as an Energy Conservation Unit which has expanded into Energy and Environment Division. It now serves even non-KAM members on matters to do with energy and environmental conservation. The programme focuses on how which enterprises can conserve energy and environment through efficient utilization of installed equipment capacity. It advises on sound environmental management in enterprises. It also advises on proper management of waste.

2. DATA COLLECTION

Forms are sent to all KAM members, potential members, and others who are interested in taking part in the energy and environment project. This data is analyzed and the individual customer is notified of the findings.

3. PURPOSE OF DATA COLLECTION

After an agreement has been signed, an audit is conducted in the customer's premises and more data on the customer is generated. The audit is conducted with a view of helping the customer save energy in particular and manage the environment in general. The data received from the audit is analyzed and compared with the information previously supplied. A one day workshop is organized with the customer to discuss the findings of the audit. The customer is monitored for one calendar year to see the progress made on the energy and environmental management in the individual enterprise.

KAM is a major link between the Government of Kenya and the private sector. KAM has been involved in the preparation of the Environmental Management and Coordination Bill now awaiting Parliamentary debate. From time to time, the KAM Secretariat sends out circulars to its members on the implications of the various sections of the Environmental Management and Coordination Bill and any other law that may affect its members. KAM also receives information from the Kenya Bureau of Statistics, Ministry of Energy, Ministry of Commerce and Industry and other international organizations such as UNEP, UNIDO, UNDP, and the World Bank, etc.

4. HISTORICAL CONSIDERATIONS

Most enterprises in Kenya were built when the price for imported oil was low, but capital was

scarce and additional expenditure for environmental conservation was not available. Many industries have now actually introduced environmental conservation measures in their organizations. Some have even set up environmental departments in their plants. Typical examples are Bamburi, East Africa Industries, and Rift Valley Textile.

Unfortunately, some plant or enterprise investments are aimed at improving production methods without due regard to increasing energy efficiency or environmental conservation. This is common where industries are family owned; they are not always professionally run. Often the enterprise owners believe that energy or environmental information about the enterprise is confidential. This makes data collection difficult.

There is need to increase awareness that investing in energy efficiency and environmental conservation is often the best economic choice and good business practice.

The liberalized Kenyan economy is subjecting the local entrepreneur to very stiff competition. Occasionally, the adverse environmental information relating to some plants is used against that enterprise as a competition device.

KAM runs regional workshops in energy and environment for its members although it is open to interested non-KAM entrepreneurs to attend. Because of budgetary constraints KAM may not provide these services effectively countrywide, particularly for small scale enterprises.

5. RECOMMENDATIONS

There is need for the government and individuals to support KAM's efforts. Environmental awareness creation in industry should not be left to KAM alone.

A Cleaner Production Center should be set up in Kenya. UNIDO has done a lot towards helping local industries with cleaner production methods. UNEP too has organized a Cleaner Production Workshop for the African Region in Nairobi in which some industries and KAM were invited to participate.

CLIMATE CHANGE MITIGATION OPTIONS AND WASTE MANAGEMENT IN INDUSTRY SECTOR

QUESTIONNAIRE

INFORMATION PROVIDED IN QUESTIONNAIRE WILL BE KEPT CONFIDENTIAL

PART 1 — GENERAL INFORMATION

1. Name of Company and Location: _____

   _____

2. Postal Address: _____

3. Telephone No: _____

4. Name of Chief Executive Officer, Head, Director etc: _____

   _____

5. Name of one or two selected professionals in charge of Energy and Waste Management:

PART II — GENERAL INFORMATION ON PRODUCTION

6. Sector of Industry _____

7. Principal Activity _____

8. Others if any _____

PART III — PROCESS INFORMATION ON PRODUCTION

9. RAW MATERIAL:

NAME	QUANTITY/YEAR
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. Recycled Material _____	4. _____

10. ENERGY:

NAME	QUANTITY/YEAR
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. Waste used as fuel _____	4. _____

11. WATER: QUANTITY/YEAR _____

12. RECYCLE: _____

13. GASES:

NAME	QUANTITY/YEAR
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

PART IV: PRODUCTS AND BY-PRODUCTS

14.

NAME	QUANTITY/YEAR
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

PART V: WASTE PRODUCTS

15. SOLID

NAME	QUANTITY/YEAR
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

16. LIQUID

NAME	QUANTITY/YEAR
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____

17. GASEOUS

NAME	QUANTITY/YEAR
1. _____	1. _____
2. _____	2. _____
3. _____	3. _____
4. _____	4. _____

18. Available plant maintenance procedures and schedule _____

_____

19. How is domestic sewage disposed of?

Pit Latrine _____ Septic Tank _____ W.C _____

Cesspool _____ Others _____

20. Available waste treatment procedures and schedule

_____

21. Are there plans to improve the process and waste management as listed above?

_____

22. How does re-use or recovery and/recycling of waste (if any) contribute towards the overall economic set-up of your organization? _____

_____

23. What do you consider barriers to your firm adopting cleaner production Methods? _____

_____

24. Has energy audit or environmental audit been done in your firm?

_____

25. What do you consider barriers to energy or environmental efficiency in your firm? _____

Financial? _____

Technological? _____

Historical? _____

Lack of Awareness? _____

Habitual? _____

Institutional Framework? _____

Any Other? _____

26. For any additional information, eg. cost implications of energy efficiency and energy and environmental management waste management etc., please use this space. _____

_____

RECOMMENDATIONS OF THE KISUMU WORKSHOP ON INDUSTRIES AND ENVIRONMENTAL LAW IN AFRICA

A. RECOMMENDATIONS RELATING TO INDUSTRY:

Four major domains of activities come out as major driving forces for economy in Africa, namely agriculture, mining, energy and transport. Therefore, there is need to anticipate future developments in these areas. The Workshop recommends:

Agriculture

- There is need for stricter administration and control on the use of agro-chemicals in farming; public education campaigns for the users of these chemicals should be launched.

- There is a need to slow down the rate of deforestation and to regulate burning of biomass as a method of land clearing. Fire should only be used for ecological management of land and only when necessary, and even then, replantation must be compulsory.

Mining

- Rehabilitation and/or restoration of mines and excavations as near as possible to the original states of the land should be undertaken.

- Harmful processing auxiliaries of cyanide in gold mining and excavation activities should be discouraged.

- Safety of workers in mining and excavation activities should be of high priority.

- In the cement industry, laws requiring the in-filling of excavated areas after the mine has been exhausted should be enforced.

- Exploitation of mineral resources should be only undertaken after the appropriate non-polluting technology is in place.

Energy

- The development of cleaner energy sources needs to be given high priority. Among the potential cleaner sources are solar, hydrothermal and geothermal.

- Use of polluting energy sources fuels like fossil fuels should be reduced or, alternatively, their firing technology should be improved.

- Patterns of over-consumption of resources should be reduced and balanced by efficient production processes.

- Further, the following recommendations should be given priority:

Governments should

- outlaw the use of lead additives to petrol.

- ban technologies that do not use energy rationally.

- explore, on an inter-governmental basis, the generation of cleaner energy and encourage sharing of power through inter-state networks to ensure optimal and equitable utilization of the resource.

Industry should

- convert, gradually to the use of energy from renewable sources.

- adopt efficient production processes that eliminate unsustainable patterns of consumption of energy.

- encourage efficient use of biomass and provide incentives for the use of solar, gas, hydrothermal, and geothermal

sources of energy as alternative sources of energy.

Transport

Governments should:

- develop the public transport system and infrastructure as a matter of priority. The shift should be directed towards improving road and rail networks and their management to encourage an efficient public transport system in order to minimize the use of fossil fuels.

Water

- Water is a scarce resource whose conservation and proper use should be encouraged at all levels. Regional initiatives should be implemented for the management water resources of regional concern such as Lake Victoria. Such initiatives must be fully participatory, involve all stakeholders and be properly coordinated through appropriate institutional arrangements.

- Governments should adopt measure to prevent the disposal of toxic chemicals in water, soil and air.

- Governments should strengthen and enforce laws governing the conservation of wetlands. Wetlands are a habitat for important soil, animal and plant species which have natural abilities to degrade, or act as ion exchangers for purification of, wastes before these enter water bodies.

- Proper use and conservation of scarce water resources should form the basis of future industrial development.

Sustainable development

- Government and industry should ensure that market-based incentives and voluntary compliance mechanisms go hand in hand with legislative (command and control) measures, consumer education and public awareness.

Industry should:

- integrate sustainable development objectives into their corporate strategies. Consequently Industries must harmonize social, economic and environmental interests with their corporate interests.

- recognize environmental management through, for example, adopting a concept like Responsible Care, developed by the International Chamber of Commerce, as among the highest corporate priorities and a key determinant to sustainable development.

- adopt Ecologically Sustainable Industrial Development (ESID) strategies based on a holistic approach that brings the environmental dimension to bear on all planning, policy and expenditure decision making.

- embrace the concept of "cleaner production" which can minimize or eliminate the need to make trade-offs between economic growth and environment, between worker safety and productivity, and between consumer safety and competitiveness as a "win-win" strategy and as a means of achieving ESID.

Technology

- Governments should ensure that environmentally sound technologies in the public domain are identified and made available to industry. Technological processes which do not satisfy environmental laws in the country of origin should not be allowed into African countries.

- Implementation of the "Polluter Pays Principle" should be preceded by clearly predetermined standards and backed up by appropriate institutional capacity, appropriate technology and management competence.

Small Scale and Informal Sector

Since the small scale and informal sectors contribute substantially to the economies of most African countries and since their activities have a disproportionate negative impact on the environment, it is recommended that their environmental impact be quantified and recommendations made of legal and self regulatory frameworks to regulate and enhance their compliance with environmental laws and with the tenets of good environmental stewardship.

Incentives

Government should provide incentives to industries that invest in environmentally sound pro-

grammes. Incentives should also be provided to industries which conserve materials and for technology acquisition by African industrialists.

Legislation

Inhibitive laws and regulations, including tariff structures whose implementation have adverse effects on the environment, should be reviewed.

B. RECOMMENDATIONS RELATING TO ENVIRONMENTAL IMPACT ASSESSMENT AS A TOOL FOR INDUSTRIAL PLANNING

The Workshop concluded that the Environmental Impact Assessment (EIA) process is a necessary tool that should be adopted by every country to manage activities which may have a detrimental effect on the environment.

Recommendations

- In order to make the EIA process part of the sustainable development objective of the particular country, it is recommended that governments should formulate an environmental policy as part of their environmental management strategies. Policies should be based on the principles for sustainable development as defined in the ICC Charter for Sustainable Development, Agenda 21, and the Rio Declaration.

- States should develop legislation to implement the EIA process.

- The EIA legislation should list the activities that may have a substantial detrimental effect on the environment and for which an EIA is compulsory.

- States should ensure that EIA legislation stipulates clearly who can perform EIAs, who will bear the cost, how data will be made available and so on. It should also ensure that all interested parties are given an opportunity to participate.

- States should ensure that the EIA process does not become prohibitive to business. Binding and appropriate time frames for compliance and review should be put in place and coordinating mechanisms within government to ensure the speedy handling of the process should be clearly specified.

- The use of Strategic Environmental Assessments should also be considered by government in order to determine the parameters for regional development plans. This would require a base line assessment of the impact of current activities in the region and enable planning authorities to judge if the receiving environment can accommodate additional development as well as the type of development which would be tolerable.

- Compliance with regulations should be enforced by government through the withholding of an authorization to proceed with an activity. The recommendations of the EIA should be considered to be design specifications for the project and incorporated into the project in order to meet environmental conservation needs.

- Financial institutions do not normally have the expertise to evaluate an EIA of a potential project. They should rely on government authorities and their advisors in deciding on issues of environmental impacts. Banks should insist on copies of the EIA Report and the record of decision of the relevant authority before a loan is approved for undertaking a relevant activity.

- In the case of projects for which no formal EIA report is required banks should use a generic check list to familiarize themselves with the potential liability from the project, before financing the activity.

- The Regulations for conducting an EIA of a project should specify the detailed requirements that will ensure that the study is credible. Credible consultants should be required for the study and for verifying the report of the study.

- Post project environmental audit should be undertaken to verify the actual environmental impacts of the project and the implementation of mitigation measures. Government inspectors in the field of air, water and solid waste emissions should frequently monitor the activity to check for compliance. Industry should institute appropriate environmental management systems to monitor and control environmental aspects.

- EIA should be undertaken as early as possible in project development and design. In this way environmental considerations will be included

into the design phase thereby avoiding costly delays in the project's implementation.

- Lack of scientific evidence concerning the exact effects of pollutants on the environment makes it difficult to determine appropriate standards with any degree of certainty. Industry should adopt a policy of environmental protection that includes the precautionary principle and favours anticipatory and proactive measures rather than reactive strategies aimed at mitigating or remedying environmental damage.

- EIA regulations should not stifle small informal activities. The concept of environmental protection should be reflected in the by-laws of local authorities. They should then control the activities in order to stop air, water and soil pollution where small business activities are conducted.

C. RECOMMENDATIONS REGARDING BUSINESS RESPONSIBILITY, SELF-REGULATION AND BANKING

- States should create enabling environments for the business community, which will encourage self-regulation and a more positive attitude towards compliance. Mechanisms to achieve this could include legislative and fiscal/market-based incentives.

- Government should work in partnership with industry to create information databases, identifying which environmental priorities can be determined and monitored.

- Governments, in partnership with international donor organization, NGOs and industry, should develop programmes to increase human resource capacity in all sectors, but particularly in the small business sector and in government bodies.

- Governments must develop and disseminate clear sustainable development objectives to assist industry in achieving compliance with environmental laws and standards.

- UNEP and other international organizations, bilateral donor agencies and NGO's should co-ordinate initiatives regarding the creation of the enabling environment at national and regional levels, particularly as Africa moves into the free-trade era, where harmonization of policies will be important.

- UN agencies, bilateral donor agencies and NGO's in collaboration with governments and informal sector associations, should devise programmes to assist the informal sector carry out its activities in conformity with the applicable environmental legislation.

- Industry driven business associations should be in the forefront of promoting public and industrial awareness regarding sound environmental performance, and Environmentally Sustainable Industrial Development (ESID).

- Business/Chambers of Commerce should promote the development and use of appropriate sectoral codes of conduct regarding sound environmental performance.

- Industry should promote the recognition of environmental management as one of the highest corporate priorities.

- Consumer organizations and industry should take a leading role in encouraging the production of environmentally appropriate products and services.

- The financial services industry should take a leading role in promoting compliance and sound environmental performance by including environmental sustainability issues in their lending criteria.

- Greater emphasis must be placed by industry on the collection and dissemination of relevant environmental information.

- National Chambers of Commerce and Business Associations should encourage industry to view eco-efficiency as a prerequisite to becoming more competitive, innovative and environmentally responsible.

D. RECOMMENDATIONS RELATING TO ENVIRONMENTAL LAW

- Governments must make continuing efforts to redress the commonly recognized shortcomings that are characteristic of existing environmental legislation in many African countries. In particular, governments should endeavour to ensure that:

- There is greater harmonization of the various pieces of legislation relating to the environment;
- There is improved formalized co-ordination between the various ministries whose decisions and activities may have an impact on the environment;
- Continuing efforts are taken to improve the capacity (technical, staffing and financial) of government departments to administer and enforce environmental legislation;
- Penalties (fines and sentences) are of a sufficiently deterrent nature (in many instances this may require that the levels of fines in existing legislation are increased to provide for inflationary impacts).
- Provision is made for the increased disclosure of environmental information from business and industry (excluding proprietary information) and that statutory protection is afforded to environmental whistle-blowers;
- *Locus standi* requirements are such that a wider group of interested parties may bring action;
- Environmental laws are made "results-based" rather than "technology specific";
- Environmental related legislation is sufficiently consistent and certain to allow for business planning and innovation;
- Sufficient power is vested in a "lead agency" with whom authority rests for the administration and implementation of environmentally related legislation;
- The development of environmental standards involves participation by business, industry and other affected parties.

• Continuing efforts must be made by governments to ensure that legislation relating to the environment is understandable and made accessible to all affected parties, with particular provision for the needs of small and medium-sized enterprises (including those within the informal sector). Where possible environmental laws should be translated into indigenous languages.

• Cognisant of the severe resource constraints and competing demands faced by governments in Africa, greater attention should be directed by governments, in co-operation with industry, to the adoption of "co-regulatory" and "self-regulatory" policy instruments. In particular, consideration should be given to the role of law and lawyers in facilitating and promoting the adoption within the business community of mechanisms such as:

- Environmental management systems and industry codes of practice;
- Voluntary reporting schemes;
- Negotiated environmental agreements (such as the Dutch covenant system);
- Voluntary environmental initiatives (along the lines of the US EPA Green Lights and 33/50 initiatives)

• In setting environmental standards and in dedicating resources to implementing and enforcing these standards, governments should reach agreement with all stakeholders on the priority environmental issues that need to be addressed. To identify priority issues it is important that efforts are taken to acquire sufficient base-line data on the state of the environment.

• Cognisant of the severe resource constraints and competing demands faced by governments in Africa, this Workshop recommends that UNEP and other international organizations promote and facilitate the adoption of "co-regulatory" and "self-regulatory" policy instruments between African governments and industry.

• Continuing efforts must be made by UNEP and other international organizations as well as bilateral donor organizations and NGO's to enhance the capacity of the business sector to effectively participate in the development of innovative environmental policy instruments. To facilitate this, it is recommended that the development of partnerships with industry associations and other related initiatives that

seek to promote sustainable industrial development within the African business community be encouraged and supported.

- UNEP must take an active role in encouraging African governments to commit themselves to the creation and implementation of regional environmental agreements in an effort to redress environmental problems relating to shared natural resources (such as Lake Victoria).

CLOSING SPEECH

By Mr. Wilson Chepkwony

Provincial Commissioner, Nyanza Province

1. This is the closing ceremony for the Workshop on Industries and Environmental Law in Africa. I am aware that the participants have had three days of intensive in house discussion and one day during which you have been in the field to visit a number of industrial centres in Nyanza and Western Provinces.

2. The District Commissioner for Kisumu District welcomed you on the first day of your Workshop. I want to broaden the scope of that welcome to the whole Province and, since I am aware that this is the first time for many of you to visit Kenya, I wish to stress that you are heartily welcome to the Republic.

3. The theme of your workshop is one that is extremely important for Kenya. As you travelled here it must have struck you that Kenya represents a microcosm of Africa. We have the full range of climatic, environmental and vegetative resources you can get in the continent. That underlies the reason for Kenya's popularity as a tourist destination.

4. For these reasons, Kenya is well-known for firm policy positions on conservation of environment and natural resources as well as preservation of the quality of the same. As many of you will realize a government's policy position alone is not enough; we have also embarked on development of comprehensive national environmental law. A draft framework bill is ready in the Attorney General's Chambers and should be presented to the Eighth Parliament soon after the general elections next month. It is that body of law which will ensure the effective and rational management of our environment and natural resources.

5. It is often the case that industries are viewed as the principal villains in the degradation of the environment. This line of thought is so accentuated by the identifiable instances of pollution that a virtual antagonism exists between industries and advocates of environmental protection especially the non-governmental organizations. Similarly, an acute adversary situation is created between industries and the government institutions charged with environmental protection.

6. The situation is curious; we listen to reports of conflicts almost as if industry is made up of extra-terrestrial bodies which visit the earth to destroy environment and then leave for outer space. For indeed, industries are created and managed by people. Surely, such people live here on earth and would inevitably suffer if the environment is destroyed. As I understand it, the participants here are from industries. Can any of you explain where you will live when the life support system is destroyed? In my view, it must take an incorrigible idiot to puncture a hole at the bottom of a ship while at sea. That is similar to destroying the life support system on earth. This is the first reason why industries, like other human beings, should be concerned about environmental conservation.

7. The second point is that most of the industries in Africa rely on natural resources of the continent. Environmental degradation is likely to destroy or otherwise deplete such resources. Wise industrial planning requires a sustainable base for its raw materials. From that point of view it seems that industries should be the principal advocates of conservation of environment and its natural resources. What would be the point in establishing an industry with its infrastructure only for the same to be abandoned in a

few years' time? It seems to me that your slogan should be "A Sustainable Environment for Sustainable Industrialization."

8. The background papers to your workshop pointed out that industries are increasingly realizing that pollution prevention pays. This is a true case of self interest in that industries can reduce wastes to be thrown out and instead maximize the volume of marketable goods.

9. I could go on with arguments along this line. But you are the experts and I believe that you have covered these points in greater detail than I could present from my point of view. My urging is very simple: it is more effective when industries promote compliance with the requirements of environmental conservation than to wait for the state police powers to enforce the law.

10. I hope that as you end this Workshop you resolve as industrialists to seek greater understanding of environmental law in your country. Do not seek an understanding to see how you can defeat its purpose. There seem to be a lot of merits for industries to promote compliance. Accordingly, there should be abundant reasons why industry should in fact be advocates of environmental conservation.

11. I strongly urge you, as you return to your countries to create, as a matter of urgency, your own national association for a sustainable environment. I will be greatly pleased to hear if you create a network among you participants so that such an association becomes continental while taking roots in the national initiatives. The environment of Africa is united even though there are regional concentrations. I urge you to intensify efforts towards the conservation of Africa's natural resources for long term industrialization and save the goose which lays the golden eggs.

12. Finally, I congratulate those of you who have met the requirements of this Workshop and have received the certificates of participation.

13. With these many remarks I wish you all a happy stay in Kenya. I urge you to take a few days after this evening to go sight seeing before you leave.

May I now, ladies and gentlemen, declare the Workshop closed.

AN ASSESSMENT OF THE WORKSHOP

The Workshop was convened at Sunset Hotel in Kisumu from 28 November to 1 December 1997.

THEME OF THE WORKSHOP

The theme of the workshop was Industries and Environmental Law in Africa. This theme was the first such theme for a conference in Africa which brought together various concerned parties in the field of industry and in the field of envrionmental law. Such interaction was a basic necessity in the development of environmental law in the continent. With regard to the industrialists, it was an essential assurance that environmental law was not anti-development. For the environmental lawyers, it was a necessary assurance that solutions to environmental problems arising from industrial activities which make economic sense would be supported. The theme of the conference was therefore an appropriate one creating a confluence between two key interest groups in the emerging regime of the environment on the continent.

PARTICIPANTS:

The participants in the workshop were carefully chosen to represent the key interest groups in the environmental regulation of industry. They were divided into the following groups and comprised of the number of persons indicated:

1. Representatives of national chambers of commerce and industry: - 4

2. Representatives of manufacturers associations - 3

3. Representatives of specific industrialists - 11

4. Representatives of Governments:
   - Departments of Industry - 4
   - Departments of Justice - 2
   - Departments of Mines - 1
   - Agencies/Departments of Environment - 7

5. Representatives of Federations of Employers - 1

6. Representatives of environment related NGOs - 4

7. Representatives of Academia - 1

This mix of representation reflected the diversity of professional backgrounds including scientists, lawyers, bankers, engineers, accountants, and other professions.

The participants were drawn from 10 countries in Africa namely Burkina Faso, Gabon, Guinea, Kenya, Malawi, Mozambique, Sao Tome and Principe, South Africa, Tanzania and Uganda.

The mix of professional and national backgrounds provided a basis for a rich exchange of information from various professional perspectives.

RESOURCE PERSONS:

The workshop was facilitated by experienced resource persons who were retained earlier to write papers on the various key issues selected by the Project Task Manager and the UNEP management. The list of these papers is attached as an appendix to this report. The papers were instrumental as key bases for guiding the discussions and highlighting the emerging trends in those key sectors. The papers were well received by the participants. Like the participants, the resource persons were of different academic and occupational backgrounds. These backgrounds included:

(1) A prominent Professor of Science (Prof. Wandiga)

(2) A prominent banker (Mr. Okomo-Okello who is also Chairman of the Kenya Institute of Bankers)

(3) A senior Manager of a Transnational Company (Mr. Karanja)

(4) Lawyers in professional practice and academia (Mr. Moolman, Mr. Ntambirweki, Mr. Moutondo, and Mr. Hanks).

(5) A Manager of a cleaner production Centre (Prof. Migiro)

The diverse professional and occupational backgrounds of the resource persons provided different but complementary angles to the discussion and especially in times of discussion sessions.

PROFESSIONAL AND ADMINISTRATIVE BACKSTOPPING

The Workshop benefitted immensely from the efficient professional and admnistrative backstopping of the Director of ELI/PAC, UNEP and the Task Manager of the UNEP/UNDP project and their staff generally but especially with regard to those issues related to UNEP competences and activities. Indeed the workshop because of this effecient backstopping was able to conduct all the desired activities within the given time frames.

THE PAPERS PRESENTED:

The papers presented at the workshop are divided into two categories:

(a) The papers presented by the resource persons

(b) The papers submitted by the participants.

(a) **Papers presented by the Resource Persons**

These papers are incorporated in this report as appendices to the report. They principally covered the various technical and legal issues relevant to environment and industry and formed the basis for discussion in the workshop.

(b) **The papers submitted by the participants**

These papers were situation reports on the performance of

(1) States

(2) Chambers of Commerce and Industry, Manufacturers association or Federation of Employers

(3) individual industrialists

on how they are coping with the demands of incorporating environmental considerations in industrial practice.

These papers formed key supplementary materials to the papers presented by the resource persons and provided key learning experiences and exchanges of ideas between the participants. These materials are also reproduced as part of this report. They illustrate that the struggle to conserve environmental resources is already a key policy objective in Africa. It is an objective which requires to be strengthened.

DISCUSSIONS

The presentation of papers by the resource persons was always followed by the discussion of those papers. The discussion was not a question and answer interaction between the participants and the presenter. Any participant who had knowledge and experience about a question raised was free to answer and demonstrate the answer with relevant experience. The participants were also free to raise any issues which may have been left out of the presentation or any other relevant matter which would benefit the participants. A summary of the issues arising out of the discussion of each paper has been prepared and is included as part of this report.

This method of discussion enriched the exchange of views among the participants and enriched the recommendations of the workshop.

PARTICIPANT QUESTIONNAIRES:

Towards the end of the workshop, the participants were given, each, a "Workshop Evaluation questionnaire". These questionnaires which were comprehensive (one is attached to this report) were required to be completed by each participant without indicating their names.

Twenty four completed questionnaires were returned to the Secretariat of the workshop. These responses are on the whole appreciative of the workshop. A few of the comments which require to be noted are:

(1) Need for improvement of co-ordination of

reception of delegates at the airport on arrival.

(2) Increased communication between UNEP and Chambers of Commerce and industry and manufacturers' associations.

(3) The need to give attention to group discussions.

(4) The need to provide practical exercises.

(5) The need to provide Portuguese translation.

(6) The need to increase time for disciplines other than law in the workshop.

(7) The need to shorten papers presented to give more time to discussion.

(8) The need to provide concrete case studies on issues discussed.

(9) The need to give more time to the formulation of recommendations.

The issues raised in the comments should be addressed to ensure better performance in future.

RECOMMENDATIONS OF THE WORKSHOP

On the last half of the third day of the workshop, the participants were called upon to formulate the recommendations of the workshop. Right from the first day the Workshop Secretariat had began identifying what looked as recommendations from the various papers presented and the various comments by the participants. The participants were also called upon to submit to the Secretariat any written recommendations they may have. A draft containing recommendations from these two sources was put together and submitted to the workshop. The workshop then created four working groups, based on the following themes, to debate the recommendations:

(a) Industry,

(b) EIA as a tool for Industrial Planning,

(c) Business responsibility, Self-regulation and Banking, and

(d) Environmental Law.

The recommendations of the various working groups were then submitted to the Plenary and adopted. The recommendations adopted are annexed as part of this report.

MATTERS FOR FOLLOW-UP

Arising from the papers presented, the discussions and the recommendations, the following are the principal issues arising which require fuller attention:

(1) The informal sector and small and medium scale enterprises: There is need to consider how environmental law should related to them especially with regard to:

  (a) EIA

  (b) Cleaner production

  (c) Awareness raising and public education.

(2) Environmental Law and Intellectual Property rights especially:

  (a) protection of proprietary information

  (b) awareness of information protected or in the public domain

  (c) technology transfer issues and technology acquisition issues.

(3) Economic and Social instruments to promote environmentally sound behaviour: the whole question of incentives, disincentives and other instruments especially how they should be structured in the African context.

(4) The Polluter pays principle especially its economic and social implications and methods of translating it into a workable aspect of law as it applies to industries.

GENERAL EVALUATION

On the whole the workshop was a success. It achieved the important aim of initiating a dialogue between environmental lawyers, government officials and industrialists on how environmental law relates to industry. That dialogue should, however, continue if the momentum to translate these ideals is to bear fruit in practice. In particular it would be most helpful if the issues raised in the follow-up section above are quickly addressed.

PROGRAMME OF ACTIVITIES

THURSDAY 27 NOVEMBER 1997

Arrival of Guests and Registration.

DAY ONE: FRIDAY 28 NOVEMBER 1997

0900 - 1030 hrs	• Introduction and welcome comments by Mr. Donald Kaniaru, Director, UNEP Environmental Law and Institutions Programme Activity Centre • Opening Address by Mr. M. M. Nzube, Deputy Secretary, Ministry of Commerce and Industry (on behalf of the Permanent Secretary).
1030 - 1100hrs	**COFFEE/TEA BREAK**
1100 - 1145 hrs	Presentation on "Impacts of Industries on the Environment" by Prof. S.O. Wandiga
1145 - 1230 hrs	Discussions
1300 - 1430 hrs	**LUNCH**
1430 - 1515 hrs	Presentation on "Law and Sustainable Industrial Development" by Mr. John Ntambirweki
1515 - 1530 hrs	**COFFEE/TEA BREAK**
1530 - 1630 hrs	Discussion on presentation
1630 - 1700 hrs	Presentation on "Promoting Business Responsibility for Environmental Management in Developing countries: What Role for Self-Regulatory Policy Instruments" by Mr. Johnathan Hanks Discussion on presentation

DAY TWO : SATURDAY 29 NOVEMBER 1997

0830 - 1045hrs	Presentation on "Environmental Law - A Strategic Issue for Industry" by Mr. André Moolman Discussion on presentation
1045 - 1100hrs	**COFFEE/TEA BREAK**
1100 - 1300hrs	Presentation on "Environmental Impact Assessment as a Tool for Industrial Planning," by Mr. John Ntambirweki Discussion on presentation

1300 - 1400hrs	**LUNCH**
1430 - 1630hrs	Presentation on "Cleaner Production Technologies and Industrialization for a Sustainable Environment" by Prof. Cleophas Migiro
	Discussion on presentation
1630 - 1645hrs	**COFFEE/TEA BREAK**
1645 - 1715hrs	Further discussion on presentation
1715 - 1800hrs	Wrap up

DAY THREE : SUNDAY 30 NOVEMBER 1997

0830 - 1045hrs	Presentation on "Reflections on the Role of Industries in the Promotion of Compliance with Environmental Regulations in Kenya," by Mr. Michael M. Karanja

Discussion on presentation

1045 - 1100hrs	**COFFEE/TEA BREAK**
1100 - 1300hrs	Presentation on "The Role of Bankers in the Promotion of Compliance with Environmental Law by Industries," by Mr. Francis Okomo Okello
	Discussion on presentation
1300 - 1430hrs	**LUNCH**
1430 - 1630hrs	Discussion on workshop recommendations and modalities for operationalizing recommendations
1630 - 1645hrs	**COFFEE/TEA BREAK**
1645 - 1800hrs	Discussion on workshop recommendations continues

DAY FOUR:	**MONDAY 1 DECEMBER 1997**
0830 - 1100hrs	Tour of Kisumu Industrial Area up to Otongolo
1100hrs	Leave for Kakamega
1230 - 1400hrs	Lunch at Golf Hotel, Kakamega
1400hrs	Leave for Webuye
1430 - 1630hrs	Tour of Panafrican Paper Mills, Webuye
1630hrs	Depart for Kisumu arriving not later than 1800hrs
1900hrs	Closing ceremony and issue of certificates of participation
	The Provincial Commissioner, Nyanza Province, Mr. Wilson Chepkwony will officiate.

LIST OF RESOURCE MATERIALS PROVIDED TO THE WORKSHOP

- AECI, *Safety, Health and Environmental Management: it's our environment too.* (Johannesburg 1994)
- AECI, Safety, Health and Environmental Performance Targets (Johannesburg
- Chamber of Mines of South Africa, Guidelines for Environmental Protection Vol. 1/ 1997 (Revised 1983 and 1995: The Engineering Design, Operation and Closure of Metalliferous, Diamond and Coal Residue Deposits, March 1996
- Chamber of Mines of South Africa *Presidential Review* November 4, 1997
- Chamber of Mines of South Africa, *World In Transition: 1996/97 Annual Report* Johannesburg 1996.
- Convention on Biological Diversity June 1992.
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- Forstbauer, Kristine and John Parker "The Role of Ecolabelling in Sustainable Forest Management" *Journal of Environmental Law and Litigation* Volume II (1) 1996 pp 165 - 190.
- Hanks, Jonathon, "Promoting Business Responsibility for Environmental Management in Developing Countries". Paper presented at the UNRISD International Workshop, 22-25 September 1995. 44 pages.
- Harris, Michael Ray "Promoting Corporate Self-Compliance: An Examination of the Debate Over Legal Protection for Environmental Audits" *Ecology Law Quarterly* Volume 23 No. 4 pp. 663-721.
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- UNEP, Environmental Law and Policy [Nairobi: UNEP/UNITAR/UNCHS Training Programme in Environmental Law. Training Series Vol. 2 27 March - 13 April 1995 ISBN 92-807-1603-4]. 440 pages.
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- UNEP Special Issue Bulletin of Environmental Law "UNEP/UNDP Government of the Netherlands Joint Project on Environmental Law and Institutions in Africa 1997. 27 pages.

- U.N., Charte Mondiale de la Nature, Résolution 37/7 de l'Assemblée Général des Nations Unies du 20 Octobre 1982.
- U.N., Declaration sur l'Environnement, Adoptée par la Conférence des Nations Unies sur l'environnement, Stockholm, le 16 juin 1972 voir Assemblée Général des Nations Unies Résolution 2994/XXVII, 2995/XXVII et 2996/XXVII du 15 décembre 1972.

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A CONCEPT PAPER, AUGUST 1997

1. BACKGROUND

The UNEP/UNDP Joint Project on Environmental Law and Institutions in Africa is supported by the Dutch Government to work with selected African countries towards the enhancement of their capacities in environmental law and institutions. From the angle of environmental laws, the project assists the project countries in the development, as the case may be, of the framework environmental laws, sectoral statutes and implementing regulations. On the side of institutions the project seeks to assist with the enhancement of the institutions in development and efficacious promotion of compliance with and enforcement of the laws in a sustainable way.

In this first phase of the project, eight countries were selected for activities of the project. Activities in development of framework laws, sectoral statutes and implementing regulations are in advanced stages in Burkina Faso, Malawi. Mozambique, and Sao Tome and Principe. Implementation of the project has also commenced in Kenya, Tanzania and Uganda. But the focus in the three countries is with issues of sub-regional character where the concern is with development and harmonization of laws in selected priority subject areas.

No systematic activities have been carried out in South Africa where the concern, upto now, has been with the development of the constitution and the evolution of national environmental policy. It is only when these processes are completed that the prospects for implementation of the project in the country will be finalized.

The core of the work to enhance institutional capacity is in the review and drafting of national laws. The Project operationalizes the concept of capacity building by involving nationals, some of whom have hardly any prior experience in environmental law, in the actual reviews and drafting of the laws. As appropriate, guidelines are provided for the reviews by nationals who work as consultants. At opportune moments, backstopping missions are mounted for experienced international consultants to review the work of the national consultants and to advise on improvement of the quality of the deliverables.

Some of the national lawyers are placed on training by attachment which involves upto two months of review of the work of UNEP and discussions at the Secretariats of different environmental conventions in Geneva. Visits have at times been extended to the relevant departments of ILO, WHO and WTO as appropriate.

Workshops have been identified as one of the mechanisms for enhancement of institutional capacities. For instance, a workshop was organized for Kenya, Malawi, Mozambique, Tanzania and Uganda on methodology for development of environmental standards. The activity, held in September 1996, focussed on air, soil and water standards was assumed to have developed a capacity which can be modified and applied to different media standards. In October/November a symposium was held for judges from *all* the eight countries plus Mauritanian, on judicial intervention in environmental matters. A training seminar on environmental law was conducted for five African lusophone countries in Maputo in April 1997 and for Burkina Faso in May 1997. In June/July 1997, the Project organized a workshop for 13 African countries on implementation of conventions related to biological diversity and in August 1997 it organized a workshop on environmental litigation for twelve countries. More workshops targeted at specific professional groups are still planned. The intention is to bring together officials, mainly lawyers but sometimes mixed groups, from the project countries to share experience and to deliberate on strategies in a hands-on way. Efforts are made to involve non-project countries in specific activities when funds can be obtained from other sources and that explains the participation of more than eight countries in some of the workshops.

2. OBJECTIVES

It is proposed that a workshop is convened to discuss the basis and rationale for building partnership with industrialists and manufacturers in the promotion of compliance with and enforcement of environmental law.

The specific objectives may be further articulated as follows:

1. To brief industrialists and manufacturers in Africa on the structure and content of modern environmental law.

2. To create a forum where industrialists and manufacturers in Africa can discuss the relations between their objectives and the goals intended in enforcement of environmental law and to promote compliance with the requirements of such laws.

3. To discuss ways in which industrialists/manufacturers can actually be partners in those activities whose objectives aim at the promotion of enforcement of environmental law.

4. To provide an example of the discourse, which should be promoted and replicated to broaden the awareness of the fact that industrialists/manufacturers, do in fact, have stakes in enforcement of environmental standards.

3. THE CONTEXT

In 1971 an article was published by A.R. Kasdan in the *Record of the Bar Association of the City of New York,* entitled "Third World War: Environment versus Development". It attracted considerable attention because, as will be recalled, governments were preparing for the celebrated 1972 United Nations Conference on Human Environment (UNCHE). The focus of the conference was, at that time, on problems of pollution by industrial effluents and urban squalor. Industrialists in western countries had popularized the notion that their economic growth, wealth and prosperity was a natural correlate of the pollution. Therefore, many developing countries (Third World) were to accept that if they were to gain any economic prosperity then they had to accept pollution by industrial effluents. Conversely, those who were mounting the efforts towards enforcement of environmental standards were in fact waging *War* against the *Third World*.

On the other hand, a number of counter-currents were evolving in the western world. The first striking development was in the oil tanker industry. Since the 1954 London Convention on the Prevention of Pollution of the Seas by Oil, and subsequent amendments in 1962, 1969 and 1971, environmentally conscious groups had pressed for the strict inspection of tanker logbooks to determine if there had been unacceptable discharge of oily waters in the oceans. The Arab Oil embargo of 1973 changed this. Oil companies discovered that the value of every drop of oil which may be discharged at sea and the fact that oily waters could be reclaimed with the combustible portions being sold while the residues being used in industries such as tar manufacture. In effect, the oil and tanker industries were maximizing their marketable goods and reducing wastes. Thus, they became partners with coast guards in enforcing environmental standards as far as pollution of the sea by oil was concerned.

The philosophy gathered momentum in the OECD countries with popular support for recycling of wastes from the old industries. This trend created more employment for the state and increased the volume of marketable goods for the industries. In 1979, Michael Royston published his book by the catchy title *Pollution Prevention Pays*(Pergamon Press). To underline Royson's thesis Dr. Joseph T. Ling, Vice President of Environmental Engineering and Pollution Control for the 3M Company wrote the *Forward* to the book. The company called 3M is the Minnesota conglomerate manufacturing industrial plastics and plasticizers. During the previous decade, industries producing plastics and plasticizers had gained notoriety for pollution by highly toxic and persistent substances. Therefore, Ling's point was that *resource-conservation technology* prevented or drastically reduced pollution but at the same time, was rewarding industries. He emphasized that in most cases, 3M manufacturing processes are revolutionary and evolutionary with emphasis continually placed on inventing and improving products and manufacturing processes, and thus, opening opportunities to eliminate pollution.

These trends suggest that by the beginning of 1980's the regime of pollution control from industries was governed by two primary forces, viz: the regime of economic benefits arising from advancement of what we have referred to above as

resource conservation technology and the traditional legal and regulatory regime of command and control.

While the sophistication of the resource-conservation technology was advanced from within the industries, changes also emerged in the structure and content of environmental law. It became increasingly clear that the command and control regime alone was inadequate to deal with the management of the environment and natural resources and to ensure sustainable utilization. The adversarial situation encouraged by litigations simply exacerbated the situation while the deterioration of environment and depletion of natural resources continued.

This led to the introduction of the precepts of management and economic incentives to supplement the intra-industry successes with resource-conservation technology. Such mechanisms have become prominent in the new generation of environmental laws which recognize such requirements as the protection of threshold of sustainability through E.I.A. in general and specific rules such as precautionary principle, environmental monitoring, environmental audit and environmental risk assessment.

To realize these precautionary measures and promote the imperative of intergenerational equity, a number of mechanisms are built into environmental laws and which have often promoted enforcement of environmental standards, or more accurately, protection of the standards from breach in the first place. They include economic incentives such as tax rebates for acquisition or development of environmentally sound technologies. Other corporate practices supported by governments and non-governmental bodies are: award schemes; bankers' power, involving banks which finance industries; insurers' power, involving insurance companies which cover the industries; consumer power; positive and negative publicity; membership in business charters and other idealistic organizations; eco-labelling and similar mechanisms which have not been considered, debated and adopted in Africa.

There are leaders in this field who are aware of how some of the practices could actually be adopted by industries in Africa in order to promote respect for environmental standards. In our view, the workshop would provide an opportunity for industries in Africa to discuss the rationale and strategies for their role in enforcement of environmental standards. We believe that many industries in African countries are ready to participate in fora where these issues can be deliberated amongst themselves as peers.

It should be noted that the debate on this subject has reached advanced stages in OECD countries. In some countries, industries are debating codes of conduct for social responsibility including on environmental protection and human rights.

UNEP has developed, with industry, a Code of Ethics which could be tested, in practice, by industry in Africa. A copy is attached for general information.

4. TARGET GROUPS AND COUNTRIES

It is proposed that this workshop aims at senior executives in the industrial sector. They should be persons who can be effective at corporate boards making arguments for what they believe in. But people with experience as production engineers may be particularly preferred. The project countries can be requested for selections made by the national associations of manufacturers, chambers of commerce and industries or federations of employers.

Five such officers from each of the project country may be a good beginning because they can input the ideas through the respective national associations. This should make a total of about forty people, and that should be the maximum.

5. METHODOLOGY AND FACILITATION

The workshop should be seminar-style which is discussional and heavily interactive. If the number forty is found to be large, which it probably is, then working groups based on thematic issues should be organized in combination with the plenary meetings. It is intended that the preparation for this workshop will be done in consultation with UNEP Industry and Environment (UNEP IE) in Paris. Their work on the subject of clean production would be instructive.

As part of the preparation for the workshop, invited participants will be requested to prepare reports outlining the activities of their organizations in environmental field and the development of conservation technology.

6. SCHEDULE

The methodology described above suggests that considerable lead time is necessary for the preparation of the workshop. It is scheduled to be held from 28th November to 1st December 1997 with the final day reserved for a field trip.

7. VENUE

Sunset Hotel, Kenya, on the shores of Lake Victoria.

8. OUTLOOK

As stated in the objectives above, it is suggested that this kind of discourse should be encouraged and supported by other agencies interested in environmental management. It is a new angle to the promotion of management of natural resources and the environment and which requires rather rapid replication because of its net benefit to the industrialists and advocates of conservation.

Therefore, it is proposed that collaboration of other agencies in the workshop should be solicited. The understanding should be for such agencies to assist in the propagation of the idea by supporting similar initiatives elsewhere.

Many of the industrialists in Africa do not have an appropriate appreciation or have rather foggy and distorted ideas of environmental law and the opportunity it may offer industry in the long term if consistently taken into account. Every effort should be made to explain the concept, its structure and the role of industrialists in the enforcement process, and for this purpose, UNEP and its partners, are ready to move into this area, and to encourage voluntary compliance with environmental law.

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