
THE ROLE OF NATIONAL AND TRANSNATIONAL CORPORATIONS IN THE AFRICAN MINING SECTOR AND THE ENVIRONMENT - THE CASE OF NONCOMPLIANCE AND ENFORCEMENT

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1 INTRODUCTION

Mining has and continues to play a major role in the economic sector of most developing countries, particularly Africa. Today, other than the agricultural sector, large and small scale mining still play a significant role in the overall socio-economic and physical infra-structural development of these countries.

The activities of transnational corporations have had major impacts on the economies and levels of employment of most African countries, through technology transfer and mining ventures. However, environmental damages have thus far been generally overlooked. This need to address environmental damages is receiving a tremendous amount of attention in light of attempts to include environmental considerations into every aspect of the socio-economic development plans and policies in African developing countries.

In view of the fact that transnational and national corporations will continue to play key roles in the development of developing countries, it is of primary importance that developing countries apply sufficient attention to the environmental aspects of mining activities undertaken by these Corporations.

Developing countries must improve and protect the quality of their environment (air, water, waste disposal, etc.) through appropriate legislation and effective monitoring of mining operations by government staff and technicians. These countries must also devote a fair share of their resources to the development of trained staff and skilled workers.

Because of the high level of expertise in environmental technology, which transnational corporations possess, combined with their managerial and financial resources, they must assist in the improvement of the technological skills of technicians of developing countries in environmental protection and monitoring.

transnational corporations must come to realize that environmental regulations must not only become a permanent part of the business climate of industrialized countries, but must also be a part of developing countries and that in the long run cooperation is more productive than opposition

As one of the studies of the United Nations Commission on transnational corporations points out: *"it is important to emphasize the limits of unilateral action in minimizing the detrimental effects on the health and environment of host countries."* In other words, cooperative efforts or bilateral efforts by both transnational corporations and governments of developing countries are absolutely necessary for the effectiveness of safeguarding the environment. Although some transnational corporations behave responsibly in one host country, they may perform the opposite in the other. In view of the above, certain measures may have to be taken at both the regional and international levels to control the behavior of transnational corporations.

First, mandatory environmental codes should be set by governments to control the behavior of these Corporations; second, funding agencies such as the World Bank, the African Development Bank and other lending institutions should link environmental considerations to the conditions for disbursing funds to the recipient; thirdly, the developing countries in cooperation with the appropriate UN agencies should develop a regional resource data bank on the environment, conduct periodic reviews of environmental legislation and assist government with an analysis of land use planning; and finally, host governments must recognize the major role of these Corporations and spare no moment in harnessing cooperation with them in the improvement of the environment.

In the developing countries the "polluter pays principle" must be employed for environmental damages. Under this principle producers of waste are liable to third parties without proof of fault for damage caused by their waste, until the waste is consigned to a third party licensed to dispose of it.

In order to make sure that the environment is secured environmental standards must be put into place. These standards must include general guidelines for the preparation of an environmental impact assessment; and detailed guidelines for the preparation of an environmental action plan or management plan for existing mines.

Mining of minerals in developing countries particularly African developing countries has often produced adverse impacts during the exploitation and processing phases. Attempts to control these impacts are now one of the most serious concerns of these countries. Despite many attempts the human and environmental costs of operations have often been great. Many developing countries are now paying the costs of tackling the environmental and health problems caused by adverse mining activities.

For new or expanded mining, however, the long experience of the impacts of mining and utilization can be drawn out to predict future impacts. Alternative development strategies, control and mitigation methods can then be evaluated in terms of their suitability and effectiveness in minimizing perceived impacts. Decisions can then be taken by policy makers or government and corporations based on these evaluations.

It is therefore, very important that environmental impact assessment be undertaken prior to the actual mining projects in developing countries and in particular, African developing countries. Any investor wishing to explore and eventually exploit mineral resources in developing countries should first provide a management plan to the State authorities for approval before mining operation commences. This will help to eliminate, or reduce adverse environmental impacts to acceptable levels.

2 TRANSNATIONAL CORPORATIONS AND THE ENVIRONMENT

Interest about the nature of transnational Corporations activities in developing African countries does not come about because of their great involvement in the economic activities of these countries, but because transnational Corporations are involved in the most sensitive environmental sectors; mineral resources, agricultural development and the manufacturing of chemicals.

For example, in Liberia , all of the four former Iron Ore Mining Companies; Bong Mining Company, Liberian Mining Company, LAMCO Joint Venture Co., and National Iron Ore Company, were all operated by transnational corporations. These Corporations deposited their tailing directly into rivers, lakes and creeks. Environmental pollution has taken its course; brick-red coloration of the rivers as a result of iron oxide suspension has occurred, along with massive

destruction of flora and fauna. In the case of Ghana, another developing West African Nation, major environmental degradation has occurred as a result of dumping untreated wastes into adjacent waters. At the Southern Cross Gold Mines of Ghana, there is the presence of cyanide in the overflow and detoxification is entirely manual and not effective.

At the Ashanti Goldfields Corporation of Obuasi, Ghana, gaseous emissions fallout from the stack, dust dispersion, tailings, spillage, tailing dam decant liquor and various liquid effluents have over a long period of time produced widespread contamination in the Obuasi area and in the down river drainage. The effects of sulphur dioxide (SO₂) and arsenic trioxide (AsO₃) on vegetation are severe near the stack and at the higher elevations along the prevailing downwind directions.

Open pit operations in Ghana, Sierra Leone, Liberia and Guinea have caused extreme sedimentation in creek beds and high-suspended sediment concentrations in down stream drainages rendering the water of several villages and towns unfit for drinking and other domestic uses. River dredging as is practised in these countries has rendered the rivers highly turbid and unfit as a source of drinking water. In instances where gold recovery aboard the dredges is by mercury amalgamation, the dredges have been reported to have lost a large amount of mercury to adjacent rivers. Oil and grease are also lost to the rivers. In the Dunkwa Goldfields Limited, Ghana, it was reported that in November of 1990 the dredges were reportedly losing about 40 kilograms of mercury per month.

In Sierra Leone, the mining of bauxite, rutile, diamonds and gold by national and transnational Corporations have caused severe damage to the land. The large pits and trenches left as a result of small and large-scale mining have not been reclaimed and reforested.

The presence of transnational Corporations in environmentally sensitive industries, like mining in developing countries, particularly Africa, has drawn attention to their operations. It has also stirred the curiosity of many local environmental organizations already critical of transnational Corporation operations. These Corporations in the past have manipulated prices, sometimes impeding the development of local industries, and drained the host country of its meager foreign exchange. Most importantly, their poor mining practices have had an adverse effect on the environment. Most of these criticisms are based on evidence regarding the activities of transnational Corporations.

Sierra Leone and Guinea produce bauxite ore, but no aluminum products are manufactured. On the other hand, although Ghana manufactures aluminum products, most of its bauxite is exported. The same argument is given by the transnational Corporations as was given for not manufacturing finished products from Liberia's iron ore and raw rubber latex; the non-profitability of manufacturing aluminum products on the local market. This scenario applies to almost all developing African countries and a large percentage of other developing countries within the third world.

3 THE LACK OF COMPLIANCE AND ENFORCEMENT

transnational corporations maintain different environmental standards and practices in their home and host countries. In transnational corporations home countries, there are strict environmental regulations and legislation which must be adhered to, otherwise they face serious penalties. For example, in the United States there are various environmental regulatory statutes like the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response Act, the Compensation and Liability Act and many other secondary statutes which have been enacted to safeguard the environment for now and

the future. These Acts were formulated by the Federal Government so as to create and maintain favorable conditions in the United States under which man and nature can coexist in productive harmony and fulfil the social, economic and other requirements of present and future generations. Other developed countries like Canada, England, Australia, Germany, etc., have stringent environmental regulations at home to safeguard their environment.

From the above account, it is obvious that transnational corporations have indulged in various types of environmental malpractices in the developing countries of Africa. However, one cannot place this type of environmental degradation entirely on transnational corporations. It is a fact that host countries are equally to be blamed for the degradation of the environment. It is not that developing countries do not have environmental laws to safeguard mining operations, the problem is developing countries, and in particular, African developing countries often fail to enforce environmental regulations and in some cases exempt some national and transnational corporations from these regulations.

At the national level, some developing African countries have comprehensive legislation and regulations on environmental protection as well as some form of supporting institutional infrastructure, like ministries, bureaus or agencies. For example, Ghana has a set of environmental regulatory systems which includes, minerals and Mining Laws, 1986, Mining regulations, 1970, Environmental Council Decree, 1974, Small-scale Gold Mining law, 1986 and the Mercury law, 1986. The People's Republic of Angola has a mining code with provisions to regulating the environment.

Another example out of Africa is The Philippines, a developing country. The Philippines has a very extensive set of environmental legislation, some of them dating as far back as the Spanish Colonial Period. The problem is that most of the national legislation or environmental protection laws are not strictly enforced, and supporting agencies of government are very weak. There is a general lack of political will and resources. In some instances, there is a degree of inadequate staff, while in some, the staff is poorly paid. For this reason, in agencies where there is a high percentage of engineers and other technical staff, a high turnover due to low pay is obvious. In many instances because of inadequate pay, local staff members are bribed and violators go unpunished or the punishment imposed is not severe enough to prevent a repeat of environmental pollution. For this reason, most transnational and national corporations find it cheaper to pollute rather than to prevent environmental degradation.

It would however be unfair to accuse transnational corporations alone for polluting the environment of the developing African countries. If transnational companies are guilty, so too are the local enterprises. Developing countries must make sure that legislation devised to protect degradation of the environment as a result of mining or whatever else must be respected by both local enterprises and transnational corporations. No one is going to take care of your home better than you would. If transnational corporations determine that laws are weak and poorly supervised, they definitely will capitalize on the weaknesses of enforcement.

Although some of the charges levied against transnational corporations for the degradation of the environment in developing countries, particularly African developing countries are true, it could also be said that in many instances transnational corporations have more merits than demerits with regards their record in environmental management than most of the local enterprises. There are several reasons why transnational corporations have to conform to government policies with regard to environmental measures.

Primarily, transnational corporations operating in developing countries are under greater scrutiny and more vulnerable to bad publicity and drastic actions as compared with local enterprises. Local enterprises may bypass government regulations and may be given several preferences with regards to the stringency with which environmental laws are imposed or implemented. Leonard Duerksen hypothesized that,

“... a host government under public pressure to do something about industrial pollution is likely to clamp down first on a foreign industry.”

Canadian Bogosu Resources Ltd. of Bogosu, Ghana, a transnational corporation mining gold in Ghana was the first company in Ghana to prepare an Environmental Impact Assessment Report, even though both local and transnational companies by Ghana's environmental laws are supposed to prepare an Environmental Impact Assessment Report for all mining projects. Perhaps it was because Canadian Bogosu Resources Ltd. was just starting when that law was passed. Whatever the case may be, that was a good start. The Corporation's policy on environment, health and safety issues is the best of all operating mines in the country. Several streams previously used by villages as drinking water supplies have been rendered unfit by Canadian Bogosu Resources Ltd. because of high concentrations of suspended sediments eroded from the mine area. Most of the environmental commitments in the Environmental Impact Assessment have been honored with the only exception of perimeter bonds around waste dumps to trap sediments and the absence of partitioning compartments in the tailing dam. Suggestions have been made by the appropriate government environmental agency to improve the effectiveness of the perimeter bonds, and to construct partitioning compartments in the tailing dam. Canadian Bogosu Resources Ltd. is also paying special attention to ensure good relations with her workforce and local people.

Goldenrae Mining Company Ltd., of Kwabeng, Ghana, is another transnational corporation operating in Ghana that has exercised a general level of commitment to minimize the environmental effects of its operation and maximize harmony with the community. Goldenrae Mining Company Ltd. has on its staff a full time land management/environmental officer and a senior assistant. There has also been an overwhelming amount of support from management and senior professional staff, both Ghanaian and expatriate with regards to the guidelines guaranteeing the quality of the environment. The corporation's operations had been preceded by an Environmental Impact Assessment study. As a result of this assessment, numerous environmental beneficial features have been included in the project design, which is laudable. Almost all of the environmental commitments in the Environmental Impact Assessment had been honored or are in progress, with the only exception being the recycling of water from the settling pond and that has been earmarked.

Goldenrae Mining Company Ltd.'s philosophy, that mining is a temporary land use, is highly commendable and is unique among most mining companies in developing African countries. Goldenrae Mining Company Ltd. has attempted at all times to inform local residents and others concerned about their plans and policies. The company holds regular liaison meetings and has paid considerable attention to the recommendations made by the government. Although it is too early to say what long-term socio-economic impact the corporation will have on the local people, the test will be when the first rehabilitation work is completed and the land turned over to their owners.

On the other hand, most mining facilities used by local companies are archaic and run down, unprofitable and environmentally damaging. Safety seems to be remote in almost all of these areas.

Air pollution does not seem to be a major environmental factor in developing countries since major sources are few and are restricted to industrial enterprises. With the exception of some internal processing operations for example, emissions at Obuasi (Ashanti Goldfields Corporation), air pollution is a minor problem.

Air pollution is also restricted to mining industries in Liberia. Dust being emitted from the blasting and crushing of high and low grade iron ores have caused damage to vegetation, restricted land use and has posed a health risk to workers and inhabitants of the area. With little or no ear protection, this poses a serious risk.

In brief, transnational corporations are forced to abide by a series of environmental procedures for several reasons. One of those is publicity of disasters by transnational corporations. This single element has caused them to incur certain expenses, not for profit making, but to foster good relations with host governments. According to C.S. Pearson, a senior associate at the World Resources Institute, these Corporations, because of their resources, employ more professionally qualified managers and skilled workers as compared with local enterprises.

4 SOME PREREQUISITES NECESSARY FOR COMPLIANCE AND ENFORCEMENT

If developing countries must improve and protect the quality of their environment, they must firstly, appropriate a fair share of their resources for the development of trained staff and skilled workers. Secondly, they must be prepared to pay better salaries to prevent violations or evasions of legislation by some transnational corporations and national companies. If concern for this urgency is not taken seriously by developing countries, the Corporations, with their qualified personnel and superior resources, will generally outperform the local enterprises in host countries for a long time.

Thirdly, because of their high technology advantage, including environmental technology, these transnational corporations can develop the best technologies for their firms and are also in touch with other advanced technologies in other industrialized countries. Because of their high-tech capability in addition to their resources, they are able to incorporate environmental technology into their manufacturing facilities, which of course are more modern, better maintained, and more efficient in terms of environmental protection, as compared with local enterprises of developing countries. For example, a transnational corporation in Malaysia has taken the lead in minimizing pollution in recovery of their tin mineral by recycling the by-products. The corporation reuses the final discharge water from the treatment plant while the solids generated are used as landfills. By utilizing its technology to use waste in productive ways, the transnational corporation met its environmental objectives.

In summary, on the positive side, most transnational corporations have the technological advantage combined with managerial and financial resources, which can be utilized to attain the goal of environmental sustainability. Their experience and the global image, which they want to protect and advance, suggest that they are more willing than ever to be responsive to environmental protection efforts than most domestic enterprises in developing countries. transnational corporations have further come to realize that environmental regulations must not only become a permanent part of the business climate of industrialized countries, but must also be part of developing countries and that in the long run cooperation is more productive than opposition.

The joint program of the United States Agency for International Development (USAID) and the United States Industry sponsored by the World Environmental Centre, in which the United States firms provide technical assistance in industrial pollution control to developing countries, further indicates that international business sees merit in cooperation in the field of the environment.

Two decades ago, the environmental movement primarily consisted of activists whose objective was to pressure government for stricter regulation of environmental degradation. In the 1990s, however, concern for proper regulation of the environment both in the developed as well as in the developing countries is not limited to activists interested in regulation. Today's environmentalism finds its strength in the opinions and values of the floor, not the ceiling of acceptable corporate environmental behavior. Environmental values and regulations must be part of the corporate culture so that managers and employees will accept environmental responsibility as part of their everyday performance. This is true for all business and industry, but especially true for the mining industry.

5 EXAMPLES ON MINING REGULATORY SYSTEMS IN SOME AFRICAN COUNTRIES

For example, the newly independent country of Namibia has drafted its first set of mining regulations which defines a very clear, yet flexible investment and mining environment to stimulate active local and foreign participation. The general approach is to encourage and foster a healthy mining industry within the public and private sectors and to promote mineral exploration, mining and local beneficiation of mineral products, for the benefit of the economy and all of the country's inhabitants with due regards to the environment.

The existing regulatory system of Ghana includes a Minerals and Mining law of 1986, Mining Regulations of 1970, Environmental Protection Council (now the Environmental Protection Agency - EPA) Decree of 1974, Small-Scale Mining law of 1989 and a Mercury law of 1989.

The Mineral and Mining law, Provisional National Defence Council (PNDC) Law 153 of 1986 defines conditions of mining leases, which include the proposed program that mining operations submitted by the proponent, takes proper account of environmental safety factors. In addition, the Mineral and Mining law specifies, under section 72 that the holder of a mineral right shall in the exercise of his rights have due regard for the effects of the mineral operations on the environment and shall take such steps as may be necessary to prevent the pollution of the environment as a result of such mineral operations. It specifies penalties for environmental degradation, which includes fines and imprisonment. It restricts prospecting near any water body, seeks to prevent water pollution, restricts the excessive grazing by animals, restricts the gathering of firewood and the cutting down of timber, ensures public safety and the safety and welfare of workers and prevents injury to persons or property by chemicals. In brief, the Minerals and Mining law of 1986 appears to be sufficient to deal with almost all-environmental impact issues.

The Mining Regulations, 1970 of Ghana has environmentally relevant provisions, which mandates that water containing poisonous or injurious chemical solutions must be effectively fenced off and warning signs erected. It further states that in no case may water containing any injurious matter in suspension or solution be permitted to escape without having been previously rendered innocuous. The regulations also include the following:

- That tailing used for filling worked out areas underground and the liquids draining therefrom, shall not contain a higher cyanide content than 0.005% expressed as cyanide of potassium.
- That ventilation in active underground workings shall be free from dangerous amounts of noxious impurities and shall contain sufficient oxygen to obviate danger to workers health.

The Environmental Protection Council Decree, 1974 of the existing regulatory system of Ghana was established to provide advisory services to the Ghanaian Government on all environmental matters. The Environmental Protection Council functions as a policy facilitator and coordinating body. Its principal functions are as follows:

- To advise government generally on all environmental matters relating to the social and economic life of Ghana.
- To coordinate the activities of all bodies concerned with environmental matters and to serve as a channel of communication between those bodies and the government.
- To conduct and promote investigations, studies, surveys, research and analysis, including the training of personnel, which relate to the improvement of Ghana's environment and the maintenance of a sound ecological system.
- To serve as the official national body for cooperating and liaising with national and international organizations on environmental matters.
- To undertake such studies and submit the reports and recommendations with respect to environmental matters as the government may request.
- To embark upon general environmental educational programs for the purpose of creating an enlightened public opinion regarding the environment and an awareness of the public's individual and collective role in its protection and improvement.
- To ensure the observance of proper safeguards in the planning and execution of all development projects including those already in existence, that are likely to interfere with the quality of the environment.

The Small-scale Gold Mining Law Regulation, 1986 requires licensed small-scale miners to observe good mining practices, health and safety rules and pay due regard to the protection of the environment. Penalties for not abiding by the small-scale gold regulation are punishable by fines and imprisonment of up to two years or both depending upon the gravity of the infraction.

The Mercury Regulation Law, 1986 controls the importation, sale and possession of mercury in Ghana. From an environmental perspective, the legislation requires that small-scale miners observe good mining practices in the use of mercury. Penalties include fines and imprisonment or both. The existing environmental regulatory system of Ghana requires an Environmental Impact Assessment. All new mining projects must submit an Environmental Impact Assessment, which must be approved before mining begins. This is commendable and it is hoped that all other African developing countries would adopt a similar pattern of environmental regulatory systems.

The draft mining code of the People's Republic of Angola (April 1, 1991), includes pertinent considerations for the maintenance and quality of the mining environment. Like the regulations of Ghana and other developing countries, the draft mining code includes environmental conduct of mining operations.

Though the draft mining code of Angola is detailed, however, it lacks an expanded section on mining and its environmental consequences. It is necessary that the Angolan draft resembles Ghana's mining regulations, which takes into consideration all aspects of environmental degradation and guidelines and penalties to safeguard such.

For example, the Republic of Sierra Leone has in its Bauxite Mineral Prospecting and Mining Supplementary Agreement (1987), Ratification Act 1998, the adoption and implementation of programs and measures approved by government for the effective reclamation of mined out areas by mining companies, and should endeavour in consultation with appropriate government agencies to undertake suitable agricultural projects within their mining leased areas in furtherance of government's Green Revolution Policy.

The Bauxite Mining Supplementary Agreement of Sierra Leone falls short of a more concrete environmental legislation. This agreement grants too much rights to the company which weakens the ability of the country to maintain its environment in a safe manner. The agreement and the Minerals Ordinance of Sierra Leone granted the Aluminum-Industrie-Aktien-Gesellschaft (Alusuisse) Bauxite Company the following rights:

- The right either within or outside the mining areas to dig, widen, and deepen channels in rivers, streams and water courses as may be necessary to permit or facilitate barge access to the washing plant;
- The right within the washing plant area to use the water and to return the same together with washing spoils to the river, stream or water course; provided that in so doing the company shall not discharge or permit to be discharged any poisonous or noxious matter in any natural water course; and
- To fell trees and clear the land to be mined.

Granting the company the right to discharge spoils from the washing plant to the rivers, streams or water course provided that in so doing the company shall not discharge or permit to be discharged any poisonous or noxious matter in any natural watercourse is gruesome. There is need for the development of very strong environmental regulations in Sierra Leone similar to the Clean Air and Water Act of the USA or the existing environmental regulatory system of Ghana. The violation of these laws must be punishable by fines or prison sentences or both. There must also be trained technicians for monitoring purposes.

In Liberia, most of the major rivers in close proximity to the iron mining companies are brick red as a result of spoils (iron tailings) being deposited into them. The iron ore mining companies of Liberia had in their agreements similar conditions as is stated in the Sierra Leone Bauxite Mining Agreement that *"the company may use the water and return same together with washing spoils to the river, stream or water course; provided that in so doing the company shall not discharge or permit to be discharged any poisonous or noxious matter in any natural water course."*

Unlike the regulation found in the Bauxite agreement between the Government of Sierra Leone and Suisse Aluminum Limited, concerning the dumping or wasting of spoils to the river, stream, or water course, the Mining Regulations, 1970 of Ghana states *"in no case may water containing any injurious matter in suspension or solution be permitted to escape without having been previously rendered innocuous. It states further that water containing injurious matter in suspension or solution should be fenced off and warning signs erected."*

These laws are enforced in Ghana under the existing Environmental Regulatory System, Section 72, which states that *"the holder of a mineral right shall in the exercise of his rights have due regard to the effects of the mineral operations on the environment and shall take such steps as may be necessary to prevent the pollution of the environment as a result of such mineral operations."* The infraction of this law by a mining company is punishable by a fine of up to Cedi 500,000 or two years imprisonment for the first conviction and up to Cedi 1,000,000 or up to four years imprisonment thereafter.

The Mining Regulation of Ghana, 1970 has environmentally relevant provisions, which are detailed, and comprehensive. These regulations should be used as blue print with minor inclusions and revisions for the developing countries of Africa.

6 THE NEED FOR COOPERATION BETWEEN TRANSNATIONAL CORPORATIONS AND AFRICAN COUNTRIES

Most case studies undertaken by UNCTC, UNEP and individual consultants show that transnational corporations can and have played both negative and positive roles with regard to environmental management in African developing countries. What is necessary is a cordial relationship between the Corporations and local governments to improve the quality of the environment.

African countries must strengthen their regulatory framework for environmental protection. What is necessary is a periodic and regular updating of environmental guidelines and a review of the effectiveness of the local environmental Ministries and Agencies.

There is a need also at the highest policy making level of government to adopt environmental planning. For example, Ministers, Directors and Heads of autonomous agencies should incorporate environmental concerns in all policy decisions. On the industry side, all master plans should incorporate environmental concerns and investment applications, which should be scrutinized for potentially adverse environmental impacts. Even more important, the host country should enforce its environmental policies more strictly and should monitor activities of all enterprises, both local and transnational for any adverse environmental impact. Strict control and enforcement are very important because government cannot be sure that all transnational corporations and local enterprises will observe and promote proper environmental control, even those with good intentions.

In many developing countries, particularly developing countries of Africa, even where there is close supervision, some local enterprises as well as transnational corporations continue to violate environmental regulations. Some transnational corporations and local enterprises believe that it is cheaper to be fined and pay the fines for environmental violations than to install expensive pollution-control equipment.

African developing countries in their anxiety to bring in foreign direct investment should not compromise the quality of their environment even if high costs are involved to maintain environmental compliance. Significant attention should be drawn to environmental protection and industrial safety in the approval for foreign investment or acquisition of technology through contractual arrangements.

Another area of major concern where enforcement is weak is the execution of Environmental Impact Assessment. Although many African developing countries are now demanding Environmental Impact Assessment studies, this requirement is not strictly observed. In the private sector many of the local enterprises have not adopted this policy. In view of this present deficiency, governments should implement the EIA strictly and insist that multilateral and bilateral donor agencies as well as local enterprises should incorporate EIA studies in all development projects.

In addition to a firmer enforcement of environmental regulations, governments of african developing countries should provide assistance, including fiscal incentives to assist and encourage all enterprises both local and transnational to observe environmental standards and practices. Technical assistance may be necessary to enable small enterprises local as well as transnational to utilize environmental technology for their own use. Governments of african

developing countries will also have to provide advice and expertise to small firms facing technical problems, provide treatment plants for toxic wastes from industries without the capital to set up their own treatment plants, help identify safe disposal sites for toxic and hazardous wastes, and finally, encourage academic institutions and the industrial sector to undertake research and development in the field of environmental control and preservation.

Further, governments should provide fiscal incentives to the private sector to encourage both local and transnational corporations to demonstrate a greater concern for environmental management. These incentives should include grants, subsidies, rebates, tax reductions, tax and duty exemptions on the import of technologies related to environmental control. Interest free loans may also be given to factories to enable them to install pollution control equipment. Reexamination of environmental regulations and tightening of them should be carried out by governments of these developing African countries. On the more positive side, these governments may also reexamine their tariff structures for products related to environmental quality with the primary purpose of providing incentives for their use. These incentives could encourage transnational corporations to transfer pollution control technology to their local establishments, implement training and further education in environmental protection.

These environmental concerns should not be left only to governments, transnational corporations and local enterprises, but the entire citizenry should also play their role by practicing environmental quality and control. In order for this to be effective, environmental awareness through education and publicity would be necessary, as this will go a long way in inculcating environmental values among the entire population.

Since the quality of the environment is the major concern of everybody, there is need for a joint effort approach between government, transnational corporations, local enterprises and Non-governmental Organizations (NGOs). Conservation pressure groups, which are growing in numbers and becoming very popular in African, Latin American and Asian and Pacific countries, have the requisite expertise and as such could serve as an appropriate watch dog, providing public education and making sure that the environment is conserved. A regular exchange of ideas through frequent dialogues and exchange of information between public agencies, private enterprises governments should be encouraged. The public should also get involved directly or indirectly in the planning and drafting of environmental standards and controls.

Transnational corporations should cooperate with one another as well as with local enterprises to promote environmental management. They should also be made to transfer appropriate technology on environmental management to local enterprises and also set good examples for such enterprises. In addition, they should appoint qualified managers who will place health and safety issues at the top of their priorities with regards the quality of the environment. transnational corporations should also develop environmental audit systems intended to reduce risks to safety and to make sure government regulations are adhered to.

As a study by the United Nations Centre for transnational corporations (UNCTC) points out, *"it is important to emphasize the limits of unilateral action in minimizing the detrimental effects, or maximizing the beneficial effects of transnational corporations activities on the health, environment and economic welfare of host countries."* In other words, cooperative efforts or bilateral efforts by both transnational corporations and governments of African developing countries are absolutely necessary for the effectiveness of safeguarding the environment. Although some transnational corporations behave responsibly in one host country, they may perform the opposite in another. In view of the above, certain measures may have to be taken at both the regional and international levels to control the behavior of transnational corporations.

First, mandatory environmental codes should be set by governments to control the behavior of transnational corporations.

Secondly, funding agencies such as the African Development Bank, the World Bank, the Asian Development Bank and other lending institutions should link environmental considerations to the conditions for disbursing fund to the recipient.

Thirdly, the African developing countries in cooperation with the appropriate UN Agencies should develop a regional resource data bank on the environment, conduct a periodic review of environmental legislation and assist governments with an analysis of land-use planning.

Finally, host governments must recognize the major role of the transnational corporations and spare no moment in harnessing cooperation with them in the improvement of the environment. This is necessary because the execution of a sound environment management program is only possible through the cooperative efforts of all concerned. There is also the need for the creation of a national environmental database intended for environmental monitoring and storage of important environmental data. Environmental information in this form would be easily accessible to policy makers and managers, as well as for the implementation of environmental programs.

7 CONCLUSIONS

In conclusion, African developing countries should bear in mind that all mining is associated with environmental degradation, but that these effects can be reduced if prior to the implementation of the projects careful planning, design and management plans are forecast. These could minimize the negative environmental impacts.

The African developing countries must also realize that there must be a husbanding between the minimization of environmental impacts and the need for a proportion of the royalties accrued from mining to contribute to the economic welfare of the countries. Standards and regulations will only become effective when African developing countries begin to institute tighter and more efficient controls. Having guidelines, legislation, policies, or standards without implementing them is a waste of time.

African developing countries will have to appropriate a fair share of their resources for the development of a trained staff and skilled workers. They must also be prepared to pay better salaries to prevent bypasses of legislation or regulations by companies. On the other hand, transnational corporations must come to realize that environmental regulations must not only become a permanent part of the business climate of industrialized countries, but must also be part of developing countries, and that in the long run cooperation is more productive than opposition.

Finally, the joint program of the United States Agency for International Development (USAID) and the United States Industry sponsored by the World Environmental Center, in which the United States firms provide technical assistance in industrial pollution control to developing countries, further indicates that international business sees merit in cooperation in the field of the environment.

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