



ANNUAL CONFERENCE

SCHOOL OF ENVIRONMENTAL TECHNOLOGY (S.E.T.)



FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA



BOOK OF PROCEEDINGS

Theme:

PRESERVING THE ENVIRONMENT

Date:

27th-29th February 2008

Edited by:

**PROF. (MRS.) S. N. ZUBAIRU, PROF. O. O. MORENIKEJI,
DR. Y. A. SANUSI, DR. A. M. JINADU & DR. L. M. OJIGI,**

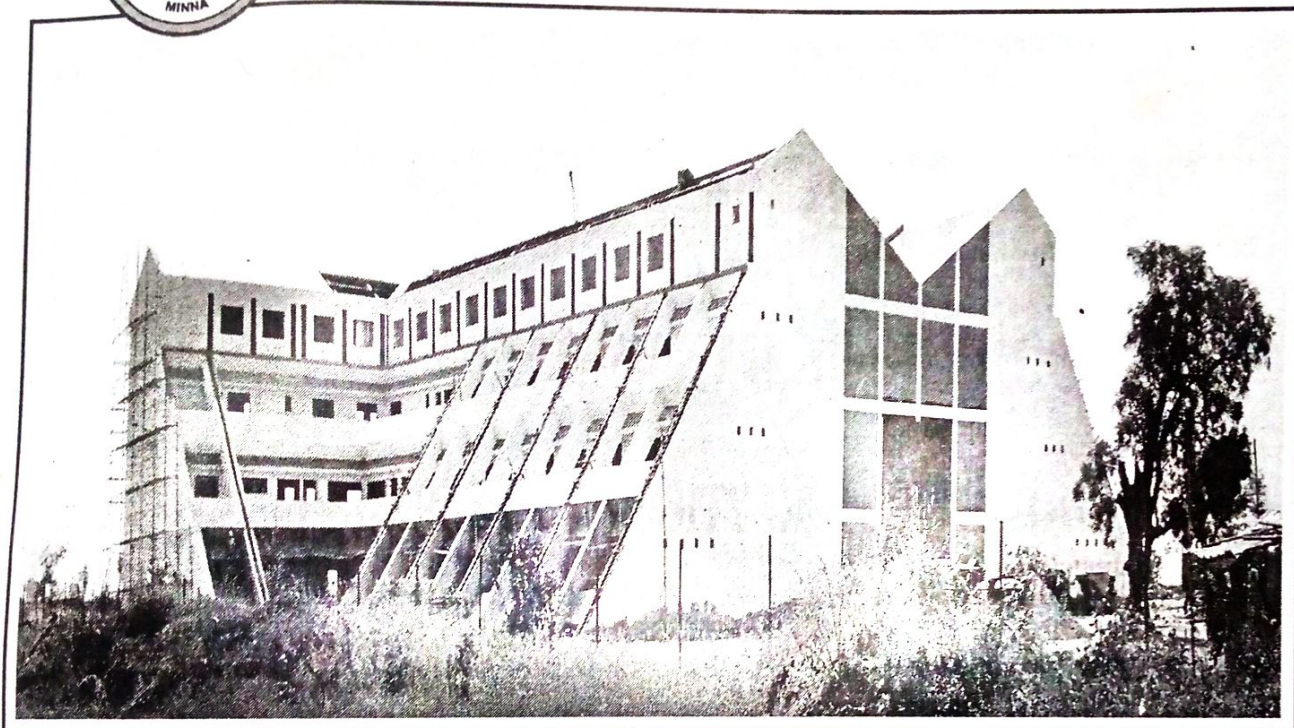
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ENVIRONMENTAL PROBLEMS OF ILLEGAL MINING ACTIVITIES IN ATISBO LOCAL GOVERNMENT AREA OF OYO STATE

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ABSTRACT

This paper examines the environmental problems occasioned by the illegal mining activities in Ofiki, Atisbo Local Government Area of Oyo State. It equally assesses how existing institutional framework on environmental protection in the state has dealt with the problem in carrying out this study. 303 questionnaires were administered on randomly chosen residents of the area while an oral interview was held with the Director-General of the defunct Oyo State Environmental Protection Agency on how his Agency has dealt with the problems. The study discovered that uncontrolled mining activities in the area had resulted in land degradation, destruction of forest resources as well as created other environmental problems. This study also discovered that awareness of environmental problems associated with illegal mining is generally low among the people living in the area. Based on these findings, the study recommends the need for extensive geological survey of the area to determine extent of deposits of the minerals being mined and the need for extensive education of the local people about the adverse affects of uncontrolled mining on the environment.

Keywords: environment, illegal, mining, problems, Atisbo LGA.

1. INTRODUCTION

Mining activities generally and particularly those of solid minerals are veritable sources of foreign exchange to both developing and developed countries. These activities also serve as agents of national economic development (SEMP, 1998). However, their negative effects on the physical environment are gaining the attention of resource analysts worldwide. In response to this growing interest in the environmental impacts of mining, the Earth Resources Centre, University of Exeter, in the United Kingdom and the Visvesveraya Regional College of Engineering, Nagpur, India jointly conveyed an international symposium in Nagpur in 1994. The symposium considered the environmental impacts of mining, particularly as it relates to developing countries where exploitation of natural resources in environmentally sensitive regions is common. Apart from this, concern for the environment has been the theme of various conferences earlier and thereafter. These include the 1972 United Nations Conference on the Environment held in Stockholm, Sweden, the United Nations Conference on Environment and Development held in Rio Janeiro in 1992, the Manchester Conference of 1994 and the United Nations Conference on Environment and Development II held in Johannesburg, South Africa in 2002. It is in the light of this increasing focus on the environment, particularly in developing countries like Nigeria that efforts are directed at examining some of the problems of illegal mining activities in the study area.

Legally, the mining and exploitation of solid minerals in Nigeria are expected to follow some setout rules and procedures. Before any solid mineral can be mined in the country, prospective miners are expected to obtain Prospective Licence (PL) and an Exclusive Prospective Licence (EPL). These instruments confer upon the holder (usually an individual on behalf of himself or a company), the rights to enter land and prospect for minerals stated thereon. This is however, after due permission of the landowner or occupier who is expected to be paid some form of compensation (Federal Ministry of Solid Minerals Development, 1995). While the PL guarantees the holder to prospect for minerals anywhere in the country, this can only be done in a particular area after the issuance of the EPL. This is granted over an area not exceeding 20.72 sq. km to a holder of a PL (Federal Ministry of Solid Minerals, 1995). Although these two instruments are pre-conditions for mineral mining in the country, individuals and groups sometimes carry out exploitation of minerals without official permission. This is what was happening in Atisbo Local Government Area of Oyo State (Sanni, 2000). While some of the organized miners in the country are increasingly becoming conscious of the various laws and

regulations governing mining in the country, some illegal miners carry out uncontrolled mining activities which results in incalculable damages to the environment.

Therefore, this paper examines the extent of deforestation, land degradation and loss of bio-diversity which the illegal mining operation has caused and the extent of dislocation in the agricultural practices of the people of the area. The paper also assessed how existing institutional framework on environmental protection in the State has dealt with the problem.

2. THE STUDY AREA

The study area, Ofiki in Atisbo Local Government Area of Oyo State lies between longitude 3020" East of the Greenwich Meridian and precisely on latitude 80 27" of the Equator. This area is located in the northern part of the state popularly referred to as Oke-Ogun. Atisbo Local Government Area of which Ofiki is a prominent settlement is bounded in the north by Saki West Local Government Area and in the east by Saki East and Atiba Local Government Areas respectively. It is bounded in the west by the Republic of Benin and in the south by Itesiwaju and Iwajowa Local Government Areas respectively.

The study area is generally a rural community with more than 60% of its inhabitants engaged in agriculture and allied activities. Atisbo Local Government Area like most local government areas in the northern parts of the State is lacking in most modern amenities and infrastructure like good roads, potable water supply and regular supply of electricity. Government presence in the area is generally less visible.

3. REVIEW OF THE LITERATURE.

Mining is defined as the process by which minerals are excavated from the ground. According to Weissberg (1993), a mineral is an ore whose exploitation is economic. The author stressed that although this definition has governed the thinking of economic investment for a long time, new factors have come to play on the international stage in recent years and many countries have woken up to the reality of environmental impacts due mainly to mining and mineral processing activities.

However, the fact needs to be stressed that mining supplies raw materials for the survival and socio-economic development of nations although this is only feasible in areas with sufficient deposits. Hence, there are frequent confrontations between mining and traditional forms of land-uses (UNEP, 1983). According to this International Agency, it happens often in the areas of agriculture and forestry as well as urban habitat and industry. However, the agency pointed out that although extraction of natural resources is inevitable, all means of preventing environmental degradation and for restoration of soils should be used on the areas disturbed by mining.

In Nigeria, however, mining started many centuries before the arrival of the Europeans. This was carried out by traditional methods with locally available technology. Gold, clay, iron ore, tin, salt and soda were among the minerals mined then. According to NEST (1991) the minerals were used in body adornment, for fabrication of weapons, tools, and vessels, for building construction, in the diet and so on. Thus, mining occupied a highly respected position in the traditional economics of large parts of the country and contributed greatly to intra-tribal commerce as well as conflicts. However, following the arrival of the British in the 19th Century, the number and varieties of minerals mined in the country increased and large-scale mining commenced.

The concern of this paper is solid minerals; which are being illegally mined in the study area. Solid mineral play many important roles in Nigeria's economy. Apart from being the source of capital formation, they constitute a source of generating economic growth. Foreign exchange earnings accrue from the export of coal, tin, and marble and also are important substitute of imports, thereby conserving scarce foreign exchange for other pressing alternative uses. According to the Nigerian Society for Environmental Management and Planning (SEMP) 1998, the location and physico-chemical properties of mineral deposits are determined by some imperfectly understood natural forces. However, prior to 1993, there was persistent decline in the production of solid minerals in Nigeria. This decline was attributed to the perennial and deteriorating problems of obsolete and malfunctioning equipments, inadequate infrastructural facilities, inaccessibility of mines due to flooding, high and rising transport costs (CBN, 1990).

According to the report, illegal mining and smuggling activities also suggest that there may be a wide gap between actual production and the falling official production figures. However, SEMP (1998), reports that with the present tempo of activities in the sector, it is likely that both the structure and monetary value of exports shall change positively. This noticeable improvement in the sector was attributable largely to government policy measures to revamp and promote the growth in output of solid minerals (CBN, 1995). According to the report this policy measure itself was in recognition of the role of solid minerals as major source of basic inputs for industrial segment of the non-export sub-sector.

Writing on the 'Rehabilitation of Artisanal Mining in Tanzania', Mutagwaba (1993) opined that small scale mining are being carried out by individuals, families and ad-hoc groups of local peasants majority of whom have no technical know-how or adequate equipment. He however, argued that despite this technical deficiency, the contribution to development of the mining industry made by these people cannot be over-looked. This is because it has become a well-established fact that many large deposits and hence many large mines have their origins from small workings. The cost incurred by the artisanal explorers in making these mineral discoveries is usually not documented as their activities are uncoordinated. If these discoveries were left to be done by the government or its agencies, few of them would be found despite the high cost of the exercise.

Despite perceived contribution of the uncoordinated miners, the inadequacy of their mining practices leads to serious environmental degradation. Mutagwaba (1993) therefore, proposed that essential mining and processing equipments required to ensure reasonable production levels and safer working conditions be made available to these miners. Even for the organized miners, only recently has environmental control begun. Macedo (1993), writing on 'Brazilian Mining at a Cross-roads: Garimpeiros, Companies and the Environment', traced the origin of environmental consciousness in the mining industry in that country to the 1970s when pollution control became mandatory and only after 1986 did the requirement for environmental impacts studies enforced.

United Nations Environmental Programme (UNEP) (1983), writing on degradation occasioned by mining opined that mining changes the geological structure, relief, water relations, local climate landscape and disturbs the soil and destroys vegetation as well. According to the agency, direct disturbance occurs relatively quickly, though the zone of influence outside the direct mining areas is less considerate. It however, contended that direct degradation occurs in old mine workings, on overburdened and waste dumps and on sites used for building development associated with mining where soils and vegetation have been destroyed. It went further to state that indirect degradation results mainly from the drainage of water from aquifers in surrounding areas. Similarly, loss of water occurs quickly in wells, with the result that surrounding populations must be provided with an alternative source of water and water must be used with economy in remote areas.

4. RESEARCH METHODOLOGY

The research was first conducted in 2000 and in 2002 a subsequent visit was made to the mining sites to assess further the effects of illegal mining on the physical environment. The principal research instruments used were questionnaires, oral interviews and extensive field observation

Three hundred and three questionnaires were randomly administered on the residents of the mining community (Ofiki) which is about 5% of the projected population of the area for 1999. This was given as 5770. In addition, an oral interview was held in February, 2000 with the Director-General of the defunct Oyo State Environmental Protection Agency. The views and opinions expressed during the interview and questionnaire administration are presented in logical sequence using frequency tables and percentages.

5. RESEARCH FINDINGS

(a) Types of Minerals being mined
Two minerals are being mined illegally in the study area. These are tourmaline and tantalite. Tourmaline was first discovered accidentally in mid 1998 and later in early 1999

tantalite was discovered. It is realized that it was the influx of some people from the Jos and Nassarawa areas of the middle belt of the country who are accustomed to these minerals that aided the discovery of tantalite. These minerals are sometimes found close to one another and people of the middle belt are known to have mined them in their area in the recent past. The two minerals belong to the solid mineral category otherwise called metallic ores. Other minerals in this category are columbite, tin, lithium and berythium.

(b) Mining Methods in the Study Area

Essentially, the mining method being employed by the army of illegal miners is surface mining with simple tools like hoes, diggers, spades and shovels. For tourmaline mining trenches are dug into the ground to a depth of between five and ten meters. The miners are usually in groups of between five and eight men. While some do the digging spadework, others specialized in bringing out the loose and sometimes coarse soil to the ground surface. Most times, it takes a group an average of between three and five days to dig into the ground before a discovery is made.

Mining for tantalite follows the same process except that it requires some specialized skills to be able to identify the associated soil types. This loose soil in which strands of the mineral are embedded are loaded into sacks, and driven to a nearby stream where the soil is washed to separate tantalite from the loose soil.

(c) Awareness of Environmental Problems

Table 1 shows the level of awareness of environmental problems resulting from the illegal mining among the people of the area, 60.4% of those sampled are aware of the existence of threats to the environment as a result of the illegal mining of tantalite and tourmaline in the Ofiki area of Oyo State. However, the awareness is only very high among the males as 77.9% of men sampled are aware of this trend. The awareness of such threats among the women is low as only 24.2% of those sampled are aware of the likely environmental problems. This is perhaps so because majority of the women are traders while substantial number of the men are farmers.

Table 1. Awareness of Environmental Problems

Response	Male		Female		Total	
	Frequenc y	%	Frequenc y	%	Frequenc y	%
Aware	159	77.9	24	24.2	183	60.4
Not Aware	45	22.1	75	75.8	120	39.6
Total	204	100	99	100	303	100

Source: Fieldwork, 2000

(d) Environmental Problems Resulting from Illegal Mining Activities

Table 2 shows some problems identified with the illegal mining activities in the study area. In the survey conducted, land degradation was seen as one of such problems. Of the respondents, 75% of males and 21.2% of females were of the opinion that this had resulted from the illegal mining activities. It is equally observed that a vast parcel of land of about 16 sq. km. had been severely devastated by the miners. Deforestation is another problem associated with illegal mining activities in the area. From the field observation, a large expanse of land had been deforested and the process is continuing. In two different sites visited by this writer, large expanse of land measuring over 12 sq. km. had been deforested by the illegal miners.

Another environmental problem identified as occurring in the area is soil erosion. Although very insignificant 7.4% and 6.19% of males and females respectively agreed with this, the field observation revealed that the occurrence of this problem on a wider dimension is imminent. This is because large trenches and burrows dug by the illegal miners remained uncovered. The respondents sampled agreed that the various environmental problems induced by the illegal mining activities has affected farm yield in

the area. These respondents reported that the area where the mining are taking place were once cultivated land whose occupants has had to give up farming as a result of the mining activities.

Table 2. Environmental Problems Resulting from Illegal Mining

Problems	Response	Male		Female		Total	
		Freq.	%	Freq.	%	Freq	%
Land degradation	Agree	153	75.0	21	21.2	174	57.4
	Disagree	51	25.0	78	78.8	129	42.6
	Total	204	100	99	100	303	100
Deforestation	Agree	54	26.5	12	12.1	66	21.8
	Disagree	150	73.5	87	87.9	237	78.2
	Total	204	100	99	100	303	100
Soil Erosion	Agree	15	7.4	6	6.1	21	6.9
	Disagree	189	92.6	93	93.9	282	93.1
	Total	204	100	99	100	303	100

Source: Field work, 2000

6. DISCUSSION AND SUMMARY

Illegal mining poses serious problems to the environment. This is known to have resulted into large-scale land degradation, destruction of forest resources, soil erosion as well as other environmental problems. There has been extensive loss of soil and vegetal cover as a result of the substantial level of illegal mining being carried out in the study area. This is despite the high level of awareness of these problems by the people of the mining community. In fact the study revealed that some farmers who were displaced by the mining activities had actually joined the army of illegal miners plundering the area. This no doubt would affect the agricultural practices of the people who are mostly farmers. The respondents are even of the view that lower farm yield have been recorded in the area since the illegal mining started.

Although the concern about illegal mining and environmental degradation are the responsibilities of both the Federal Ministry of Solid Minerals Development and the Oyo State Environmental Protection Agency (SEPA) now Oyo State Ministry of Environment and Water Resources respectively, none of them seem bothered by what is happening in the study area. The Mineral Act of 1999 provide for the arrest and prosecution of persons engaged in illegal mining in the country. Such persons upon conviction are liable to imprisonment terms of twenty-one years. It is however, instructive to note that in recent times nobody has been caught and prosecuted by the relevant agencies. Similarly, the challenge of environmental degradation should worry the Oyo State Environmental Protection Agency, an organ charged with the responsibility of protecting the environment in the state. It is however, not so. In an interview conducted with the Director-General of the agency by this writer in 2000, he expressed helplessness in dealing with the problems stating that his agency had dislodged the miners on several occasions only for them to return days after.

It is the considered opinion of this paper that if the problem is not promptly attended to by both the Federal Ministry of Solid Minerals Development and the Oyo State Government, the physical environment of the area would be subjected to further abuse and this would definitely impact negatively on the agricultural practices of the people of the area.

7. RECOMMENDATION AND CONCLUSION.

Having identified some of the problems posed to the environment by the illegal mineral exploitation in the study area, it is pertinent to provide some measures with which to ameliorate the situation. The Oyo State government should embark on serious land reclamation measures to restore the degraded environment and provide further incentives to encourage food cultivation among the people of the area that are beginning to take more to the illegal mining. In addition, the people of the mining community should be properly educated by the Local Government authorities about the dangers of illegal mining particularly as it affects the environment. The Federal Ministry of Solid Minerals Development should embark on an extensive geological survey of the area to determine the extent of deposits of the minerals being illegally mined. Based on the outcome of the geological survey, the Oyo State government should proceed to establish a mining company registered with the Ministry of Solid Minerals Development to carry out exploitation of these minerals. To overcome the likely problems that may ensue between the mining company and the community, Mining consultative committee made up of local government officials, representatives of the state government, members of the community and management of the mining company should be set up.

Finally, the Oyo State Ministry of Environment should develop a more responsive mechanism of combating problems of environmental degradation, unlike the lukewarm attitude it paid to the study area when the problem first broke out.

REFERENCES

- Central Bank of Nigeria (1995) Annual Report. Central Bank of Nigeria. Abuja.
Central Bank of Nigeria (1998) Annual Report. Central Bank of Nigeria. Abuja.
Federal Government of Nigeria (1992) Environmental Impact Assessment Decree. No 83
Federal Ministry Of Solid Minerals Development (1995) Procedure for Entry into the Mining Industry. Ministry of Solid Minerals Development, Abuja.
Federal Ministry of Solid Minerals Development (1995) 'Procedure for Entry into the Mining Industry, Ministry of Solid Minerals Development, Abuja.
Heath Mike (1995) Mineral Development and Environment: Impacts of Mining on the Environment mm Problems and Solutions, Geoscience and Development, No 2.
Macedo. A.B (1993) Brazilian Mining at a Cross-roads: Garimpeiros. Companies and the Environment. AGID News. No 74/75, May/June.
Matagwaba. W (1993) Rehabilitation of Artisanal Mining in Tanzania. AGID News. No. 7405. May/June, Nigerian Environmental Study/Action Team (NEST) (1991) "Nigeria's Threatened Environment", A National Profile, Ibadan
Sanni, L. M. (2000) Environmental Effects of Illegal Mining Activities in Ofiki, Atisbo Local Government Area of Oyo State, Unpublished MURP Dissertation, University of Ibadan, Ibadan.
Society for Environmental Planning and Management (SEMP)(1998) "Pilot Study of Environmental Appraisal and Development of the Gold Mining Areas in Atakumosa West and East Local Government Areas of Osun State.
United Nations Environmental Programme (UNEP) (1983) "The Rehabilitation and Restoration of Land and Soils after Mining Activities, UNEP, Nairobi.
Weissberg, I (1993) A New Project Approved by AGID, Mining and Sustainable Development, AGID News, No 74/75 May/June.