

UTILIZING ENVIRONMENTAL RESOURCES (MINERALS) FOR REGIONAL ECONOMIC REHABILITATION AND RELIANCE

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Abstract

The physical environment of any country provides both problems and opportunities for the inhabitants. Opportunities available may include soil types, forests, climate, minerals, water bodies etc. Often, harnessing environmental resources available does help in improving the quality of life of such people by raising their economic fortunes and self-reliance. The paper looks at a regional development planning approach to utilize mineral resources as a means of improving the economic well being of any identified stagnant region that is identified to have mineral resources. The paper argues that regional economic development planning problems are faced by all types of economies, socialist or capitalist. The work also reviews some regional growth theories and strategies. A table showing the distribution of solid minerals in Nigeria is presented. Ten minerals are available in large quantities. Another table also shows those of the minerals that are being exploited is also, provided. The paper recommends the utilization of solid mineral exploitation can be added as one of the approaches to regional economic development amongst some existing strategies,

Key words are: Regional Planning, Minerals, Economic Development, Technological and Environmental Impacts.

Introduction

The successful planning of a regional development program is one of the most difficult tasks facing the modern world. It is a problem shared by advanced industrial nations and those in early stages of development. The problem also exists in both capitalist and socialist economic systems (Smith, 1971: 447). When a regional problem or a region has been identified (e.g. rural stagnation) the central government and the people are left with several options of tackling the problem including the option of leaving things as they are. Since the second world war (it would seem) the industrialized nations have influenced deliberately, through policies and actions the location of economic activities in a predictable manner, hence regional development, may be done through the use of theoretical base utilizing some natural endowments like mineral deposits.

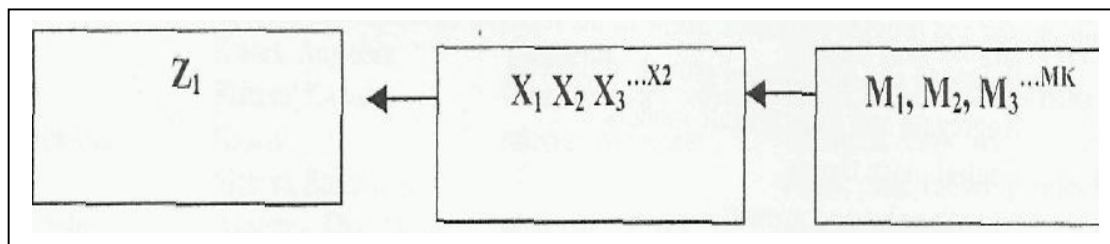
The paper presents that the exploitation of solid minerals in Nigerian can be used as an effective means of regional development for the purpose of raising income levels and general qualities of life in such areas. By means of the following objectives, the assertion is discussed.

- i. A review of some regional growth theories and strategies for development
- ii. A survey of the geographical distribution of solid minerals in Nigeria and their production
- iii. Exploitation of the minerals as a means of regional development.

Review of Some Regional Growth Theories, Strategies and Approaches for Regional Development

A region may be easy to visualize and imagine, but difficult to define. It is a geographical concept. De Blij (1977: 3-8) defined a region to be an area of specific location, which is in the same way distinctive from other areas, and which extends as far as that distinction extends. Regions could be formal or functional and both can be on a single or multiple categories phenomenon. Formal regions have visual homogeneity e.g. similar ethnic area, extent of area containing some mineral deposit, topography (e.g. river basin) etc.

Regional growth theories, strategies and approaches to regional development are not (the same thing). However when used in an objective sense (i.e. for denoting development) the terms have a strong theoretical relationships. This is explained by the use of Figure? 1



Target
Variable
Planning

Explanatory
Variables
(Explanatory model)

Instrument
Variable
(Planning Strategy)

Figure. 1 Basic Model of Regional Development (Smith, 1971:448).

In this model, the target Z, of a depressing region or a rural area may be to raise levels of incomes of those areas. The explanatory model defines the functional relationship between the variable, which accounts for the magnitude of the target variable.

The explanatory model of this case could be the out flow of resources and people from a depressing area is greater than the inflow. An instrument (planning policy, and a strategy legislation an) is used so that the target variable may be achieved. The actual utilization of such a model as Figure 1. is sometimes restricted by inadequacy of the existing explanatory models and say regional settings or rural conditions by non availability of suitable data base and great complexity involved in designing regional and interregional governmental decisions.

These restrictive problems of actual utilization of the model result into either using explanatory models both as models and strategies and approaches to achieve a target without a clear understanding of the explanatory models. This is seen in the next section where many explanatory models are as well strategies for regional development and or rural development.

Regional Growth Theories

Regional development planning is for the purpose of correcting or improving an area or areas identified to be problem areas. A regional problem is determined by the nature of the society and its value system. It is the society that decides whether a certain condition constitutes a problem by reference to observed facts to whatever goals or conception of social justice the people hold.

Thus a regional problem may be basically thought of as some unsatisfactory condition, which is associated with substantial area or areas. The problem may be recognized simply as existing within the area in question viewed in isolation or may arise partly from relationship between these and other regions. The problem of some rural or hinterland areas of Nigeria are considered to be that of the later i.e. their relationships with urban regions. In this view, the urban areas drain rural areas of human and material resources making people who live there worse off.

In other words, the relationship between urban regions and rural regions leads to deterioration of rural areas. Sometimes the problem of rural areas may be of a different nature e.g. poor accessibility within the larger regional setting. In such a case the rural setting may not have current information of human and resource development and so will be left behind. Problem of such rural areas may include high infant mortality rate, poor nutrition, low life expectancy, subsistence economy, etc. It is against the above problems and related ones that regional growth theories intend to explain their causes and provide remedies. Some of the regional development theories are:

- i. Balanced and unbalanced growth of theories
- ii. Aggregate and disaggregate models
- iii. Central place theory
- iv. Growth poles and growth centres
- v. Core-periphery concept
- vi. Polarized activity centre

The above six regional development theories lend themselves either to centralization of economic activities to raise income levels of populace over the whole region or dispersal of activities to achieve the same purpose. Their difference and advantages are not discussed here, but suffice to say that mineral exploitation can be done with reference to regional development model (s) so as to raise the incomes of areas where they are being exploited.

Survey of the Distribution of Solid Minerals in Nigeria and Their Production

The mineralogist defines minerals as a natural solid, generally formed by inorganic process with an ordered internal arrangement of atoms and a chemical composition and physical properties that are either fixed or vary within a definite range. The requirement that a mineral be solid eliminates natural fluids such as petroleum and natural gas for consideration as minerals (Dietrich and Wicander, 1983: 22-23) Nigeria among other African countries like Guinea, Zambia, Zaire, Zimbabwe and South Africa are richly endowed with solid minerals, like all other natural resources, the distribution of solid minerals in Nigeria is not ubiquitous. That of Nigeria may be inferred from Table 1.

Table 1
Nigerian Mineral Resources, their Geographical Dispersion and Major Users

MINERAL	STATES OF OCCURRENCE	RESERVES	INDUSTRIAL CONSUMERS
Barytes	Benue and Plateau Benue, Anambra	Moderate to substantial	Oil and gas Drilling Aluminum, Refractoriness,
Bauxite	Ondo, Plateau	Occurrences only	Abrasives, chemicals, refractories,
Clay	Widespread Anambra, Benue, Plateau, Bendel,	Large reserves Coal: Substantial	Construction, refractories Power and steam generation,
Coal/Lignite	Kwara, Bauchi, Plateau, Bauchi, Kaduna,	Reserves over 400m Tons proven reserves	Steel, chemicals, other Metallurgical
Columbite	Kano, Benue		Ferroalloys Filtration, abrasives, paint, Asphalt products, paper, Plastics, refractories,
Diatomite	Bonio Kwara, Plateau	One deposit of at Least 50,00 tons of good grade diatomite	
Feldspar	Niger, Benue	Moderate, low quality	Glass, ceramics, abrasives, soap
Glass, ceramics,	jewelry, electroplating Anambra and Benue, Oyo	Small deposit Small	Kaduna dentistry, electronics, chemicals, pharmaceuticals
Fluorspar		Several million tons thinly distributed in shales	
Gypsum	Sokoto Bendel, Oyo	In association with Cessiterlic	Pigments (for paint), chemicals iron and steel, cement, heavy,
Timernite	Plateau, Bauchi Kwara, Anambra Plateau, Kaduna,	Over 100m tons proven reserves, low grade	Media, Paint, rubber, plastics, Ceramics, drugs
Iron Ore	Bauchi Plateau, Sokoto, Imo		Paper, paint, rubber, plastics
Kaolin	Anambra, Oyo, Ogun	Moderate - Large	Ceramics, drugs
Lead	Anambra, Imo Benue, Plateau Bendel, Anambra, Cross Rivers, Sokolo, Kwara, Bendel,	Moderate - Large	Batteries, gasoline. Construction Radiation shielding: ammunition
Limestone/ Marble	Ogun, Bauchi, B	Deposits large	Cement, steel, sugar, chemicals, Construction refractories, Chemicals, Fertilizers, detergents, livestock, Feeds, food products
phosphate	Ogun, Rivers, Benue	Sizeable salt iodine's with Rather weak salt concentration	Chlor-alkalis, pulp and paper, glass, Ceramics, Foodstuffs, soap and detergents
Salt	Plateau, Gongola		Construction, iron and steel, ceramics Glass
Sand	Widespread Bendel, Anambra	Large	
Silica (glass) B Sand	Rivers, Lagos, Niger, Kaduna Anambra, Imo	Substantial	Glass
Silver	Plateau	In association with lead	Photography, Silverware, electrical/ Electronics, jewellery Glass, chemicals, pulp and paper.

Industrialization in Nigeria P. 118 (1992)

From the table, it can be observed that ten (10) minerals are present in large quantities in Nigeria. There are Barytes, Clay, Coal, Diatomite, Gypsum, Iron Ore, Lead, Limestone, Sand and silica. Of the ten minerals that are abundant in large quantities five are effectively mined. Reviewing the distribution of the mineral in the former 21 states structure, fifteen states have some solid minerals deposits apart from clay and sand that is present in all states of the federation. This means that their distribution is such that if the minerals exploited in the various areas of location are done with a development objective for each area, there will be widespread improvement in the quality of life of such areas. This entails holistic development of the area such that when the mineral is exhausted the area will not become a wasteland and deserted environment. The exploitation of any mineral depends on: -

- i. The size of the deposit
- ii. The depth at which the ore occurs
- iii. The distance of the ore body from the consuming market i.e. domestic demand
- iv. The existence of a satisfactory labour supply
- v. The availability of capital
- vi. The availability of the energy for exploitation
- vii. The international demand for the mineral

In Nigeria some minerals are not being exploited because of one or more of the reasons listed. Table 2 shows the degree of exploitation of solid minerals in Nigeria.

Table 2 Major Solid Minerals Production Between 1960- 1987 (Tonnes)

Year	Cassiterate	Clay	Coal	Columbite	Limestone	Marble	Tin-rr
1960	10,581	n.a	573,000	2,088	243,942	-	-
1965	13,142	n.a	743,000	2,599	1,312,252	1,138	9,488
1970	10,797	n.a	48,207	1,642	688,364	8,047	8,067
1975	6,268	n.a	248,791	991	1,697,954	5,714	4,657
1980	3,570	n.a	175,977	554	2,064,954	640	2,678
1981	3,178	44,336	104,225	337	1,503,472	3,735	2,486
1982	2,478	15,843	56,110	167	1,541,236	2,735	1,809
1983	2,102	37,487	53,573	79	1,541,236	981	1,245
1984	1,776	77,726	76,077	81	1,891,457	1,104	1,334
1985	1,110	88,497	137,743	100	1,742,638	2,137	1,085
1986	99	29,785	144,383	12	1,388,138	12,161	91
1987	211	310,192	117,069	47	2,576,622	1,298,222	4,832

Source. **Industrialization in Nigeria p. 117** (1992)

The table reveals that the exploitation of some minerals has increased while for others it has decreased. The exploitation of coal and limestone has been steadily, that of columbite and tin has been declining except in 1987 where tin production increased by 500 per cent from the preceding year. This maybe as a result of new and increased uses for tin as alloy (Sharpe, 1987). It was not possible to find out why the production of columbite has declined. But price, which determines amount of investment in that direction may be a reason.

Regional Development by Means of Solid Mineral Exploitation

Although mining is often thought of as a 'robber industry' because it steals from the soil and never returns. A planned and integrated mineral development of Nigeria must be so. In Nigeria, the common approaches to regional development or rural development have been one or a combination of these:

- Basic needs approach
- Community development approach
- iii. Agricultural development and extension approach
- iv. Intergrated rural development approach

Of the approach listed above, the exploitation of minerals can be incorporated into the community development approach and the integrated rural development approach. In this regard, before exploitation of

a mineral deposit is embarked upon the community participation will include decision making on the utilization of skills, physical environment conservation during and after exploitation.

hi the planning stage for the exploitation a mineral, impact region should be delineated. Suitable economic impact models that are used in predicting the impact of an industrial development could be used. The Keynesian regional multiplier is used in predicting industrial development impact.

The regional multiplier is the regional propensity to consume goods and services produced within the region. In general a change in regional income (dy) can be related to a change in regional exports (dx) by the export. It may be argued that for mining activities, the economic model may not be readily applicable, because mining activities fold up when deposits are exhausted. It is in this regard that this paper presents that the planning of mining activities should include length of exploitation and the stability of the community after exploitation. Other papers in this conference would have looked at environmental impacts. So the suggestion in the paper is that planning for the mineral exploitation should include social impacts, technological impacts, environmental impacts and certainly economic impact at both the short and long terms. All this can be part of the integrated rural development approach.

For larger mineral operations the areas can become small growth poles for the development at self-sustaining level even when the mineral exploitation is gone.

Conclusion

The contribution of the mining sector to economic development of many African countries is apparent. The railways lines in Liberia for instance were due to the exploitation of iron ore. In Zaire, a 283 railways line was built to handle the exploitation of manganese (Adejuwan, 1979:135). The extension of railways line from Jos to Lagos in 1913 (before the Port Harcourt line arrived Lagos later) was to exploit minerals found in the area. There is a recent example of how mining has been used to stimulate growth in rural Australia (Tykylainen 1996:226).

The above are examples of national and regional impacts of the exploitation of minerals. The impact can extend to actual mining communities raising their income levels. This paper has argued that the aftermath of mining activities need not be derelict environment, depopulated community with declining economic fortunes but a sustainable community. This will be possible if the planning for mining activities include other related bodies like Federal Environment Protection Agency (FEPA), Ministries of Industries, Agriculture, Town and Regional Planning and Mines and Power to raise the income levels of the communities and the nation's at large.

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