

INTRODUCTION

Nigeria has been experiencing rapid urbanisation occasioned by uncontrolled organic and consciously created urban settlements. This explosive rate of urban growth has been attendant with complex socio-economic, physical, and environmental problems. Government intervention instruments have included formulation of urban planning and development policies, laws, establishment of sole-purpose urban development agencies, and adoption of urban development plans. Despite these efforts, the situation on ground indicates an apparent lack of effectiveness in the management of the fast growing, newly created urban settlements. This state of things bothered the author and compelled him to embark on a study to find out whether the intervention instruments used in the attempts to redress the situation were responsible. The focus of this paper is on determining the efficacy of the Urban Master Planning Paradigm for effective management of the New Federal Capital City (Abuja) by assessing the extent of the implementation of the provisions of its Master Plan on Land uses and environmental condition after the expiration of the official life's span of the Plan. This work constitutes only a portion of a comprehensive empirical study of the entire implementation exercise of all the proposals of the Plan in question under-taken by the author (Jiriko, 2004). The paper looks at the concept of the traditional urban master plan, its origins, its suitability for effective management of the attendant problems of rapidly urbanizing and changing Nigerian situation. The genesis of the New Federal Capital, the objectives of the plan, the problems encountered in the course of implementing the aspects of the plan under review and their associated causes, two null hypotheses were set and validated before recommendations are made for appropriate solutions. The paper acknowledges the inability to present the land use proposal map and that of the actual situation on the ground after the implementation period because the scale of these maps would be too small for any meaningful comparison; hence, only hard data were used.

The Methodology of the Study

The paper is a product of data and information synthesized from primary and secondary sources which are the products of a comprehensive empirical research conducted by the author (Jiriko, 2004). This source should be contacted for details.

NATURE, CHARACTERISTICS, ORIGINS, AND CRITICS OF THE TRADITIONAL URBAN MASTER PLANNING

The idea of "master" planning can be said to have its roots in the concept of "blueprint" planning. "A blueprint" denotes a pre-determined end-state outcome or plan that cannot be altered in the course of implementation. It connotes "rigidity" or "inflexibility". It acts through the medium of a "master plan", hence, blueprint planning (Ratcliffe, 1974). It adopts a comprehensive approach to planning and is, particularly, long-range in life span - 20 or 30 years or even half a century as in the case of the Kaduna Master Plan (Nigeria). Master planning is adopted and applied to provide solutions to urbanisation problems that are **mainly** physical in character which include land use maps, zoning, density controls, building regulations, and planning standards.

Master planning has had its fair share of criticisms from a notable number of critics. Devas and Rakodi (1993), for example, stated that many of the ideas and principles applied in city development in developing countries (including Nigeria) from the colonial era were derived from the practice of town and country planning in Britain. Many of these practices (including blueprint/master planning were already falling out of favour even at that time) were transferred wholesale and adopted with little or no adaptation to local conditions. Clark (1992) pointed out that master plans (static in nature) are attuned to a scenario of slow urban growth in which investments can be carefully planned in the context of a finite long-term plan, in terms of the planning approach. MC Neil (1983:118) makes it categorically clear that

This physical "master plan" approach has found increasing disfavour in developed countries but was exported into many less developed countries during the 1950s and 1960s where it is being used.

Based on his experiences in developing countries, especially in Singapore (Malaysia), Lagos (Nigeria), etc, in the early 1960s, Koenigsberger(1982) revealed that the cities of developing nations were growing and changing faster than the European cities did at the height of the Industrial Revolution. In addition, he found that conventional planning methods are insufficient to guide their development; master plans specifically have had little effect on such growth. He also found that town planners had become very

unpopular; a fact confirmed by Awogbemi (1997) with specific reference to Nigeria. This situation, according to Koenigsberger, posed two inevitable questions needing answers. Firstly, why did the master plan system fail in those places where it was tried? Secondly, was there something in the planning methods used that made them inapplicable in those tropical cities? The answer got in the final analysis was the realisation that the master planning method was unsuitable because it has been developed for a different type of society. That led to the demand for new methods better suited for the dynamic urban condition of the developing countries. On the need for new methods, Koenigsberger (1982) asserted, and rightly so, that "a change in method does not mean that we wish to abdicate our belief in planning: but that we knew that the choice of the right method could make all the difference between public acceptance and rejection of our plans, between success and failure.

Richardson (1993), based on his experiences (or work) in developing world cities in India and Pakistan, among others, declared that master plans prepared for several cities have been almost useless. These plans usually involve widely inaccurate population and land use zones that deviate, often dramatically, from reality. Farvacque and McAuslan (1992), too, argue against master plans by stressing that the master plans take unnecessarily long time to prepare; the planners seldom evaluate costs of the proposed development or try to determine how they could be financed, and also pay little attention to the necessary resources and financial feasibility of policies and programmes. Both critics posit further that many plans are seldom based on realistic appraisals of the city economic potential or likely population growth while communities and their leaders and implementation agencies are seldom meaningfully involved in the master planning process. Finally, that those master plans are infrequently updated and their static nature cannot keep up with the dynamic process of city growth in the developing world. Also inadequately addressed by the master plans is the question of the role of the public and private actions, including the links between spatial planning and financed planning.

Urban master planning goals have been criticised for being those of the specialist planners rather than the community's. The goals are meant to guide specialist planners in their deliberations on how the community should develop and for evaluating the proposals of specialist planners contained in the master plan. The master plan indicates how the "policy makers want" the community to develop in the next 20-30 years, (Black, 1967) or even 50 years!

Literature abounds on the performance of the conventional master plan and /or physical development plans outside of Nigeria. On the actual performance of the city master plans, Branch (1974:204-5) reveals that "few master city plans in the United States have significantly shaped the development of cities". He reports of a survey or estimation which indicated that large city planning departments are responsible for less than 10% of either the fact or form of municipal growth and development. He reveals the fact that just one year after the master plan documents are printed, they are usually out-moded in important respects and largely forgotten after several years. They, therefore, end-up on shelves. He then laments the fact that despite this sad story, the delusion persists among practising city planners in the U. S, that the concept of the master city plan had been right and the records wrong. His conclusion is that master city planning with all its untenable presumptions "is a concept which has brought more satisfaction and job security to the city planners who formulated master plans than results for the urban inhabitants who are the intended beneficiaries".

In Britain, the traditional urban planning was exemplified in the development plan, the equivalent of the American Master City Plan. In conception and scope, both types of plan were essentially physical (land use) plans. The 1947 Act introduced a comprehensive system of planning - the development planning system - for county towns, cities, and countryside. The essential feature of the system was "end - state" planning as both national and local administrations worked towards future blueprints solutions [Cherry, 1974, in Brouton, (ed.)]. Regarding methodology, the development planning system was the high water-mark of the centralist approach to planning, an exercise in stale direction, hence, top-down. The flaws of the development plans and system became evident in the early 1960s: plan-making machinery for the country was found to be out of phase, which often made coordination between plans of authorities very difficult. Also, the plans were becoming increasingly unrealistic in a rapidly changing society. For example, several of these development plans became outpaced by events and outdated before they were approved. Koenigsberger (1982:5) corroborates this point with further deficiencies of the concept of the development/master plan vis-a-vis rapidity of changes, thus:

The thinkers of the 1930s and the war years found it difficult to imagine the speed of change which we are experiencing today. This is clearly evidenced in the

concepts of the master plan. Even when we call it a development plan and revise it every five years, it remains fundamentally a static concept providing for limited... change and ultimately for cities of finite size

Critics found the development plans to be deficient in policies and inadequate as guides to developers and as bases for control, concentrating on detail and that their inflexible form and content are not adaptable to new techniques and concepts while the centralised procedures required for amendment impose long delays on attempts with rapidly changing circumstances.

Consequently, the Planning Advisory Group (PAG) Britain was set up in 1964 to undertake the general review of the planning system- including the development plan system and the method of control overdevelopment. PAG found the deficiencies of the planning system to include the fact that the development plan did not enable the proper integration and development of land use and transportation policies (Crook, 1974): the relationship between regional policies and local development plans had been undefined and uncertain, and concluded that the main deficiencies of the development plan system approach arose from the abandonment of the concept that plans should be concerned with indicating the general principles upon which the development in the area will be promoted and controlled.

PAG then recommended the introduction of new models of regional and local planning; structure - and local - planning. These were to be embodied in the county (regional) structure and urban structure (broad policy issues) plans and local action (detailed) plans (PAG Report, 1964). The potential scope of the structure plan is extremely wide and allows for the integration of social, economic, transport, and environmental issues.

In Nigeria, critics of the master planning model include Mabogunje (2002) who pointed out that planning based on the notion of a master plan has been discredited for many reasons, especially in developing countries such as Nigeria. This is because it worked relatively well only in urban conditions characterised by slow growth of population, high average household income, and effective enforcement capacities. These were conditions commonly found in developed nations. On the state of art of urban planning (and management) in Nigeria, Falade (2002) reveals that it is fashioned along the traditional comprehensive planning

approaches in which the land use master plan is the end-product; a top-down process that gives no room for effective participation of the people for whom the plan has been made. This kind of approach may seem suitable only in eras when autocratic regimes thrive. The Presidential technical Committee on the implementation of the New Urban Development and Housing Policy in Nigeria concludes authoritatively that:

The present system of managing the affairs of the Nigerian City, dominated by the discredited, unworkable, unsuitable master planning approach, plagued by non-performing multiple and functionally-duplicated urban agencies, is no longer tenable or effective and would need to be replaced (Mabogunje, 2002)

On the legislative flaws, Utuama (2002) categorically states that "the legal basis for the application of urban land use control and development in Nigeria remained essentially colonial in origin and ideology even after independence. Sule (1986), Sahabo (1995), Ilesanmi (1994), Mshelia(1990), and Dawam (1982) have all revealed, based on mostly opinion studies, the inability of master plans to deliver in Maiduguri, Jalingo, Yola, and Jos, respectively. Nze (1986) confirms the minimal success of planning schemes in Imo State. Both the Nigerian writers and the general public seem not to agree that the intended objectives of the master plans have been achieved (Suleiman, 1988).

Agbola et al (2002) assert that the era of master planning in Nigeria came to an end with the introduction of the Environmental Planning and Management (EPM) process in 1994. Awogbemi (1997) succinctly summarises the deplorable state of the urban areas in the country, apparently to the shame of planners' failure, thus:

What is happening in urban areas in Nigeria is so bad that all ask the question; are there planners in Nigeria? If there are, what are they doing. .can any urban planner stand up in any assembly and gladly declare himself as a town planner without being mocked by all?... a completely new approach must be evolved to deal with urban problems within the context of urban management

Mumtaz (1983) corroborates the first part of the above quotation by declaring that the greatest single shortcoming of planning has been, perhaps, the use of inappropriate methods. This write up aligns with the two positions. Abuja Federal Capital is chosen among many new town projects because it is a national project and national prestige, pride, and integrity of the Federal Government are at stake. Given the Federal ownership and commitment to the New City project, the question begging to be answered at the end of this paper is whether the instrument chosen to guide the growth and development of the New City (The master plan) has been efficacious.

Genesis of the New Federal Capital (Abuja Project)

Heightened and persistent, intolerable conditions of living and working in Lagos, intractable traffic, chronic housing shortages, overcrowding, environmental and sanitation problems, dual status of **Lagos as State and Federal Capital as well as the country's commercial** nerve centre, lack of land for expansion, fear of possible foreign (submarine) attacks due to its coastal location were among the potent factors that necessitated a new National Capital City (FCDA, 1986, Dantata, 1993, Mabogunje, 2001, Northern Star 2001). The Military Administration in 1975 set up the Aguda Panel to study this situation and to recommend as appropriate. The Panel recommended, among others, the movement of the Federal Capital from Lagos to Abuja FCT, a centrally located area, with equal access to and from all parts of the country (Aguda, 1975, (The MFCT, 1993, The Comet, 2000). The Panel's recommendations were accepted and the New Federal Capital Territory was created by decree No. 6 of 1976.

Abuja Master Plan and its Objectives

To realise the dream for the New Federal Capital, a guide-frame for the orderly development and systematic prevention/avoidance of the problems that characterise(d) Lagos was required. A comprehensive, conventional long-range master plan was commissioned and prepared by the International Planning Associates (IPA) and submitted to the Federal Capital Development Authority (FCDA) in 1979. The Plan's lifespan was 20 years (1980-2000). The objectives of the plan, packaged from inference from the master plan and other literature include:

1. To create a new capital more conducive to the efficient administration of Federal Government than Lagos proved to

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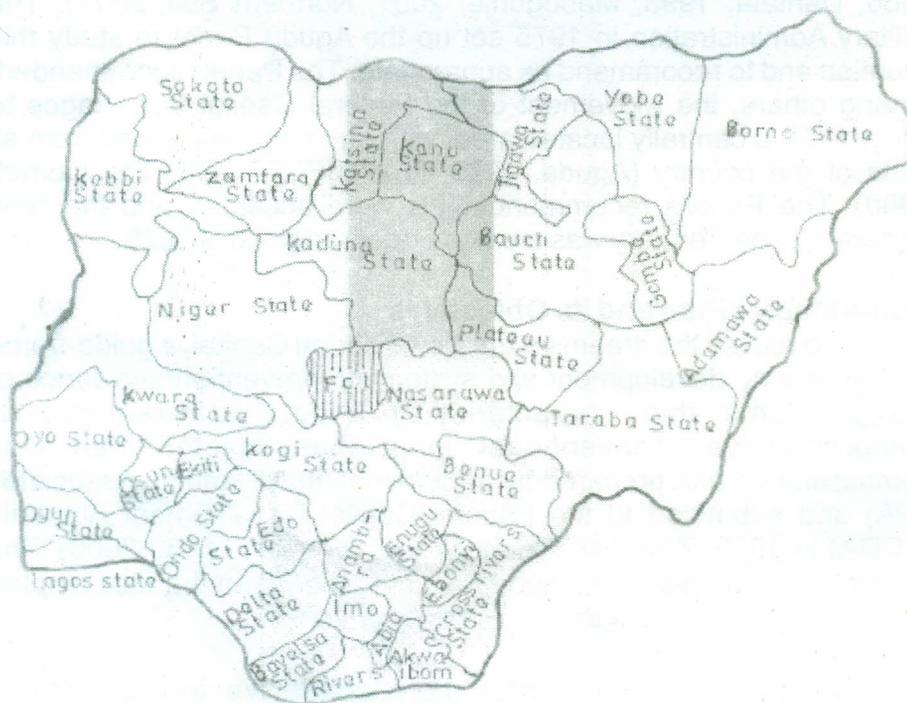
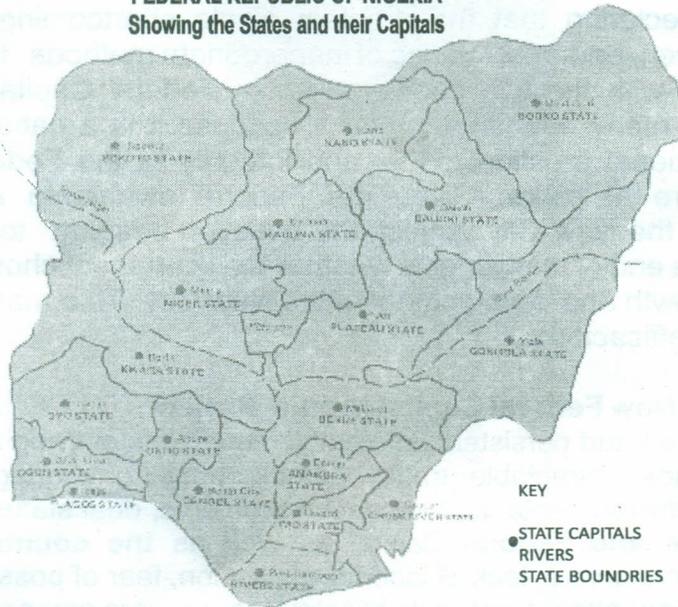


FIG 1: THE LOCATION OF ABUJA

- ii be (4th Nat. Dev. Plan, 1981 -85);
- ii To locate a capital in the geographical centre of the country (Aguda, 1975, Mabogunje, 2001);
- iii To build a capital city for the pride of all Nigerians (Vatsa, 1083/84);
- iv Make a befitting capital that would be the pride of the Blackman world-wide (Vatsa, 1083/84);
- v Bring socio-economic development to the (new capital city.) region (Mabogunje, 2001);
- vi Create a beautiful capital city; and
- vii To facilitate rapid national economic growth and development. To achieve these noble objectives, land had to be proportionately allocated to the different land use activities. This is the subject of the next subsection.

Master Plan Proposed Land Uses/Laud Use Budget

The proposed land use budget for Abuja Federal Capital City (FCC) is as summarised in the table that follows:

Table 1: Proposed Land Use Budget, Abuja

S/No.	LAND USE	ALLOCATION (HA)	% OF TOTAL
1.	Residential	12,486	48,66
2.	Commercial/Bus. District	561	2.19
3.	Industrial (public services)	891	3.47
4.	Industrial (research/ training)	920	3.59
5.	Transportation	1,705	6.65
6.	National Government	500	1.95
7.	Sports and Recreation	160	0.62
8.	Parks, Open Space	8,435	32.87
	Total	25,658	100.00

Source: Abuja Master Plan, 1979, in Jiriko (2004).

The extent of implementation of these proposed allocations of land uses after the expiration of the Abuja Master Plan's implementation span will be treated later. Meanwhile, the yardsticks to be used in assessing the performance of the Abuja Master Plan are explained below.

Criteria for Evaluation of Performance of Plan Projects/ Programmes

Talen (1997) rightly observes that understanding why planning succeeds (or fails) should be one of the main occupations of planning. Devas and Rakodi stress the need for some criteria on which to base our judgments when evaluating the performance of plans which have been implemented, interventions already taking place or policies proposed. Some of the yardsticks applied in evaluating the performance of plans, projects, or programmes include:

- a. Prior to the commencement of a plan, if the agreed objectives and targets of cost, quality and time are to be achieved within tolerable limits, the cost and resources to be deployed must be re-determined in a baseline, plan. Timeliness of plan project completion is of particular importance (Talen, 1997).
- b. Actual progress must match planned progress so that all significant stages take place at the scheduled date, leading to final completion on or before the planned date (Burk, 1993). If this fails, the planned time scale will be exceeded; this means the original cost estimate and budgets will be exceeded too;
- c. Costs in planning are time-related: any lost time, therefore, has to be paid for in terms of, e.g, inflation on cost of materials, management overhead, administrative services and general facilities, and on labour and wages. Lack of meeting set objectives within set time is tantamount to the planned project ending up as wasted effort and resources, leaving the client or the planner ultimately disillusioned or disappointed;
- d. The use of conformance view of evaluation criterion has also been proposed (Talen, 1997). To what extent had implementation conformed to the plan's objectives or proposals? This view seems to accord with Roberts' (1974)

Goals Achievement technique of plan evaluation;

- e. By setting goals and, (hence answering the question "how much progress towards the goals marks success?" (Weiss, 1972). Related to this or in addition, she suggests comparison of the results with absolute standards (i. e. using "checklist' of items developed as) with other 'programmes' and "standards of service" as the criterion measures for evaluation; and with the opinion of experts and the planner for judgment of success.

This research has substantially worked on and applied these evaluation criteria and suggestions. Weiss (1972) further makes a notable point which is that since evaluation inherits the fallibilities of the plan or programme, the best that evaluation can do, often, is to accept the plan or programme's assumptions and find out how well near- terms goals are being achieved. She reiterates the fact that plans or programmes attempt to set in motion a sequence of events expected to achieve desired goals. According to her, if a plan or programme is unsuccessful, there are two categories of reasons: Either (a) it did not activate the 'causal process' that would have culminated in the intended goals (i. e. plan or programme failure), or (b) it may have set the presumed "causal process" in motion but the process did not "cause" the desired effects (i.e. theory failure). This paper interprets "plan or programme failure" as synonymous with failure to achieve proximate measures (or objectives) while "theory failure" refers to a situation where the achievement of proximate goals (objectives) does not lead to final desired results. The next subtheme examines the extent of the implementation of the land use and environmental condition provisions of the Abuja Master Plan after its lifespan had expired using the listed yardsticks.

Master Plan Implementation Period and Land Use and Environmental Problems of Abuja

The Law/Decree formally declaring Abuja the New Federal Capital of Nigeria was signed by the then reigning Military Administration on 12th December, 1991. This was, no doubt, a dream realised. However, it must be quickly added that ***the movement was rushed.***

The original decision of a new national capital site that will be a "no-man's land"/neutral site affording "equal citizenship" to all its residents has not been achieved. The reason for this failure is due to

lack of adherence to the original decision to evacuate and compensate the original inhabitants outside of the FCT. In 1978, the then Military Administration issued directives that made the issue of resettlement and compensation optional and at the discretion of the inhabitant except in places required for immediate development (The Comet, 2000). The planned resettlement of Abuja indigenous inhabitants was thus abandoned. This lapse is being exploited by the indigenous community in their agitation and struggle for integration into the FCC/FCT. This situation has affected the proper implementation of the Master Plan land use proposals.

Regarding the time span for completing the implementation of the provisions of Master Plan or the development of the new capital city (the baseline period for evaluating the success of the implementation of the plan), the Aguda Panel recommended that the "development of the Federal Capital Territory should be accomplished in 20 years from 1976". Yet in reality it took the Federal Government over twenty-four (24) years to just develop Phase I of the Plan of the FCC. In fact, as at August, 2001, the Executive Secretary of the FCDA said "on the stage of the development..., 80% of the First Phase of the Federal Capital City had been completed" (Abuja Today, 2002; 1). It was only until May 2002 that the Federal Government approved the opening up of Abuja Phase 11 and the provision of basic infrastructure to all its districts.

In terms of the number of plan reviews so far undertaken (another success evaluating criterion), the IPA Consultants proposed quinquennial reviews of the Abuja Master Plan. However, evidence available as at December, 2002, pointed to the fact that there has never been a single review exercise (Jiriko, 2004). A workshop on the Review of the Abuja Master Plan, held in Dumber, 1999, and sponsored by MFCT/FCDA (MFC 1, 2001), is acknowledged, though, even then, the said workshop did not amount to an actual review of the Plan.

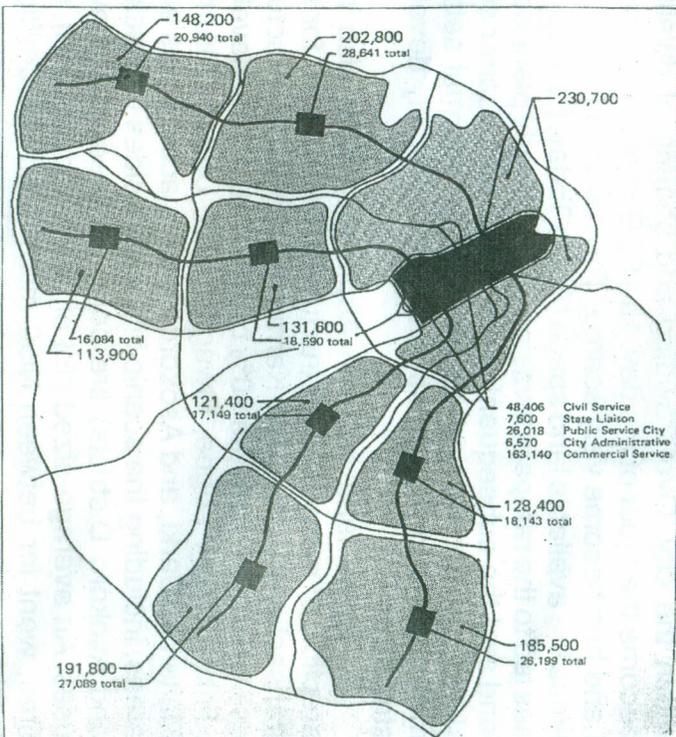
The FCC Master Plan has been bastardized. The rushed movement of the seat of Federal Government from Lagos to Abuja led to the influx of population into the new capital. On the planned population of Phase I vis-a-vis the population on, the Chairman, Board of Directors of the FCDA, is reported to have revealed that "the Master Plan had been thoroughly distorted by residents of the New Capital, pointing out that although Phase 1 of the City was originally planned to accommodate 250,000 people, it was currently accommodating more than one million (1,000,000,06^ people

(Jiriko, 2004). This influx of population has led to a number of problems that have given birth to certain actions or activities which, in turn, have impacted negatively on the planned objectives of the FCC Master Plan.

TOTAL LAND USE REQUIREMENTS

Based on employment and population breakdowns developed in the programming process, the facilities requirements within each functional sector were identified. These requirements were based on current Nigerian practice and new service delivery systems under development in Nigeria as well as international practice where relevant. Three types of standards were developed related to service and facility systems:

- *The need*—what facilities/services are needed



Acute housing shortage is one of the serious outcomes of massive population drift. Ikejiofor (1998) attributes this problem to the failure of public housing programmes to achieve their targets and inability to attract large-scale private sector housing provision within the city. Overcrowding and sharing of dwelling units have become the order of the day. The FCC occupies a pre-defined area. Land has become very scarce. The demand for land is about three times the available land space (Abuja Today, Feb. 13-19, 2002). This has led to the rampant invasion of the already planned and budgeted land and the subsequent development of squatter settlements and slums (residential and commercial) or informal settlements, other make-shift commercial structures and illegally developed religious structures.

Illegal land sales in Abuja City have also resulted in the erection of many illegal structures. Areas noted for rampant illegal transactions include Idu-Karmo, where illegal structures have been estimated to constitute 90% of all the structural developments there (Jiriko, 2004). Lugbe, Gwagwa, Jibi, Utako, Durumi, Gudu, Jabi, Maitama, Garki, and Asokoro Open spaces, parks and recreational areas, including the scenic hilltops/hill sides (especially in Maitama and Asokoro Districts) are being invaded and converted to other uses. An average-sized plot of land on top of a hill, even as at that time, went for between N150 million and N200million! Residential land use areas were converted to educational or commercial uses and vice versa.

On the environmental condition, garbage is a rampant problem. All the squatter/slum settlement areas and other illegally developed areas lack the essential infrastructure, facilities and services, hence, they constitute potential degraded environments.

The Phase 111 of the Master Plan covers Idu, Karmo, Gwagwa, and Lugbe settlements, among several others. It is in these areas that the Master Plan implementation had not virtually touched after the expiration of the lifespan of the Master Plan. This Phase witnessed the highest magnitude of invasions, squatting, conversions, etc. About 90% of the structural developments in especially Idu-Karmo axis are said to have been illegally developed. During 1996-1998 period alone, 268 ha (embracing 51 contraventions) of land designated as open space or park were lost to the total reservation for greens/recreation. The private (organised/unorganised) sector, government and the diplomatic sectors are all involved in the contravention acts. Out of the 100 cases of contravention by types of developers (1956-98) analysed

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and reported in Phase I, the private sector came first with 80% of the cases, followed by government with 19%, and lastly by, even, diplomatic missions with 1% of the cases (Ministerial Committee Report, 1998, Abuja).

Urban planning paradigms have been dynamic (changing). Paradigm periods and planning developments have been outlined (Kuhn, 1972; Galloway & Mahayni, 1977). Some five paradigm periods have been identified together with their essential characteristics. These are Pre-paradigm Period - characterised by competing schools of thought and absence of consensus on a single paradigm; Paradigm Development (1920 to 1950s)-which saw paradigm consensus and formalisation, and legitimised alien, of Comprehensive Land Use Planning as a local government function; Paradigm Articulation - during which research efforts (e.g. theories and methods in planning articulated) and practice were governed by paradigm; Paradigm Anomaly Period - which witnessed nature's violation of the paradigm, with the emergence of phenomena which the paradigm cannot explain and/or resolve: the planning effectiveness/methods were criticised; and Paradigm Crisis Period (1960s and 1970s) during which efforts were made to resolve the anomaly within the existing paradigm leading to emergence of competing schools of thought and attempts to formulate alternative paradigm. It is in line with the above developments that Kuhn (1962:77) concludes: "the decision to reject one paradigm is always simultaneously the decision to accept another". Galloway et al (1977: 67) corroborates Kuhn's (1962) position in terms of the chronology of each of the planning models, thus:

As one inspects the chronology of each of the individual models, one finds that they chained together. In that the deficiencies of the precursor generate further conceptualizations which shape the new model. For example; the absence of certain normative attributes in the allocative decision model stimulated the formulation of the innovative one.

Mba(1992) confirms that the comprehensive urban master planning (paradigm) in Nigeria is still monolithic and technical-oriented; that is, dominated by the physical perspective. This is in spite of the fact that urban planning profession in Nigeria could be said to have come of age. Technocratic town planning was the creation of an age when governments had power over relatively

homogenous societies experiencing moderate rates of urban growth. New Urban Planning is needed for a rapidly urbanising world where governments only have power to "influence and not to dictate and where many urban societies are increasingly characterised by heterogeneity and poverty" (Hague, 2005). Many Nigerians, including Sokomba (1983), therefore, wonder at the inability of the country to break from the cords that tie her to this "used to" mode of urban planning and to fashion or adopt more germane urban planning paradigms.

Hypotheses

1. **Hypothesis No.1:** There is no significant difference between the proposed land uses as contained in the Master Plan and the observed land uses after the implementation period.
2. **Hypothesis No. 2:** There is no significant difference between the proposed environmental conditions as contained in the Master Plan and the observed environmental conditions after the plan implementation period.

Validation of hypotheses:

On land uses, the plan proposals are as shown on Table 3 below.

Table 3: Performance of Land Uses, Abuja (FCC) Master Plan.

Land Use Category	Planned	Observed
Residential (Plots)	24,006	10,836
Commercial ((Plots)	4,176	1,562
Open Space/Park (Plots)	112,467	41,267
Roads (km)	1,019	336
Drains (km) concreted	1,063	367

Source: F CDA/Literature/ Author's Computations, in Jiriko (2004)

The "t" test on this hypothesis yielded a T- computed value of 1.301 and T-tabular value of 2.776 (at the 5% significant level).

The data on how the Master Plan Implementation fared in the area of environmental condition objectives is shown on Table 4 below.

Table 4; Performance of Master Plan on Magnitude of Environmental Problems, Abuja FCC.

Environmental Situation	Planned/Required	Observed
Solid Waste:		
-Generation (M3) - whole City	806,000	736000
- Weekly) Collection (No. of times)	2-	1
Disposal Sites (Perma.)	2	0
Land area required per 666,000 Pop (M2)	200	0
Collection Nodes/District Nodes/District	4	2
Admin/Mant. Land Area required/Land Fill Site (ha.)	6	2
Commercial/Informal Sector Squatter areas	0	14
Residential Slum Areas (No.)	0	10
Unsatisfactory refuse disposal (% H/H)	0	62
Unconventional toilets (%H/H using them)	0	31

Source: AEPA /Literature/Authors' Field Research Findings, in Jiriko (2004).

Discussion

The "t" test analyses show that the null hypotheses on land uses and environmental condition have greater T- tabular values (2.776 and -2,62) than their T- computed values (1,301 and -1,002) at the 5% significant level in that order. This means that the Null hypotheses cannot be rejected at the 5% significant levels. It equally means that there has been no significant difference between land uses and environmental condition as provided for in the Master Plan and as observed after the implementation period of the plan.

However, after the implementation period, the Abuja City problems the Master Plan was supposed to have forestalled namely, chronic housing shortages and overcrowding, ubiquitous and uncollected solid waste, rampant and illegal squatter/slum settlements and commercial structures, pollution, non-availability or poor access to public conveniences and other forms of environmental degradation, the indigenes factor and the continued existence of indigenous settlements within the FCC and FCT.

This means the Abuja Master Plan had not delivered: it has not been efficacious in the planning and development of the New Federal Capital City, especially the attendant problems of fast urban growth. Very importantly, this is a very clear indication of the failure of the master plan concept (i. e. theory failure) as well as programme failure because, although the "causal factors" were set in motion in both cases, they did not lead to the solutions to the problems of the city even though the results of the two hypotheses showed no significant difference between the proposed land uses and environmental conditions and the observed situation on the ground, respectively, after the plan implementation period. This is in spite of the fact that so much Federal Government might and resources were committed to the execution of the New Federal Capital City Master Plan project.

Changes, Distortions, Illegal Conversions of Proposed Land Uses Corroborating the Validated Hypotheses:

The following changes, distortions, and illegal conversions of the planned land uses in the course of developing Abuja City (Jiriko, 2004) support the outcome of the validation of the above hypotheses:

- i. The allocation of 32.55% of the total land budget for the development of the city for green and open space uses is seen to be somewhat abnormal; the usual proportion of 10-15% is suggested. (Ago, 2001).
- ii The conversion of the employment area for Maitama District into the Government Parastatals zone.
- iii. The creation of Jabi Dam/Lake and bridge, covering some 220hectares of the City's prime land meant for main residential development.

iv. The conversion of the entire Garki 1 (originally planned for the three density **categories**) into a high density district.

v. **Provision of septic tanks and soak-aways to completed houses in Garki [and Wuse I] Districts** as against the Main Sewer System proposed in Phase I.

vi. Overhead connections of telephone and electricity supplies done in Garki I and **Wuse I Districts** instead of the underground system proposed in the Master Plan;

vii. Major **Government/official distortions which include the development** of Military Barracks, Aso (Presidential) Villa, former Federal Ministry of Works and Housing (**now Ministries of Works, and Housing, Environment and Urban Development**), Jabi Dam/Lake, and the National Stadium.

viii. The integration of Garki Village (Phase E) and (potentially) other existing villages in Phase II make them potential future slums- a stark deviation from the Master Plan objectives; and.

ix. The redesign of the plots along Accra Street (Wuse) and the conversion of a primary school site in Area I neighbourhood into a mosque are also among the numerous distortions/conversions, etc of the Master Plan proposals.

The changes, encroachments, conversions or distortions affect(ed) virtually all the land uses. There are not less than 348 such cases, one of which is a completely new district (Guzape) that was created and contiguous with Western Asokoro Extension (Jiriko, 2004). Most of these were found to be concentrated in Phase I with few in Phase II. The private (organised/unorganised) sector, government and the diplomatic sectors are all involved in the contravention acts. Out of the 100 cases of contravention by types of developers (1996-9B) analysed and reported in Phase I, the private sector came first with 80% of the cases, followed by government with 19%, and lastly by, even, diplomatic missions with 1% of the cases (FCT Urban and Regional Planning Tribunal, 1997).

In another development, out of the 32 neighbourhood centres proposed in the Master Plan for the six residential districts in Phase I, 28 (88%) were found to have been either fully converted to corner shops or partially subdivided. Cases of double plot allocation

identified numbered 85, at least. What would seem to be an executive summary of the extent of illegality and the overall performance of the Abuja Master Plan with respect to housing and other land use proposals is provided by The Country (May, 27-June 2, 2002). According to this weekly publication, if strict compliance with the Master Plan were to be adhered to, not more than 1,000 houses will remain. The majority of the houses, it continued, were illegally built while **the majority of the allocations** were diverted for different **purposes other than what originally they** were meant for,

Participation of stakeholders in the Abuja Master Plan preparation process was also found wanting. The preparation of the Plan was essentially a public sector affair. No mention is made of the involvement of the built environment professionals, especially town planners, outside of the one or two on the assessment panel. Nothing has been said of the involvement of the organised private sector, NGOs, Civil Society, Community-Based Organisations, traditional institutions and the general public (the collectivity of individual Nigerians).

Citizen participation is about stakeholders' consultations, actual involvement, and sharing in the power and responsibilities inherent in the planning and control of land use. These include problem identification and prioritisation, formulation of community goal and objectives to achieve stated future desires, involvement in the preparation of alternative strategies, evaluation of the various proposed developments and their implementation, monitoring and review, among several other issues such as voting and being voted for (Lietman, 1994). Participatory democracy has an educating function (Pateman, 1970). Indeed, planners cannot effectively move too far ahead of public opinion (Cullingworth, 1982),

CONCLUSION AND RECOMMENDATIONS

The paper has examined the application and the efficacy of the urban master plan paradigm in the planning and development of the New Federal Capital City, Abuja, with a particular focus on the implementation of the proposed land uses and environmental conditions contained in its Master Plan after its official lifespan. The conclusion from the analysis and findings is that the urban master planning paradigm exemplifies the blueprint concept which is a rigid, detailed end-state planning model which was not meant for application in the fast urbanising and changing Nigerian situation, but was imported wholesale and applied without modification. It has

not been efficacious in the planning and development of the Abuja Capital City, especially in those aspects under review in the cities. Both the theory underlying the master plan and the Plan programmes (proposals/objectives) have been found to have failed. The urban master planning process has also been found to be top-down, undemocratic or non-participatory. Urban planning paradigms, historically, have also been found to be dynamic: inefficacious ones were abandoned and new ones were evolved and applied. Furthermore, a six months delay in any project implementation has been found 10 times to increase project costs by 30- 33% (Gray and Larson, 2000). This would imply that a year's delay in the implementation of the Abuja (FCC) Master Plan increases the Plan's costs by a minimum of 60% to about two-thirds! If the number of years that have elapsed since the expiry of the official lifespan of the Plan is taken into account, one may not be too far from the truth to assert that these extra costs which have been expended and are still being expended in the implementation of the Plan would be sufficient to build one or more other new towns/cities in the country. In the light of the foregoing, the following recommendations are made as to the way forward:

1. More suiting and efficacious urban planning paradigms should be adopted for effective planning and management of rapidly growing new (capital) cities in Nigeria;
2. The Strategic Environmental Planning and Management (SEPM) Paradigm is recommended. The merits and attributes of this paradigm include its strategic visioning, integration of all components, its being holistic or comprehensive, democratic, flexibly dynamic and process oriented, environmental sustainability, feasibility, and efficacy and functionality. Very importantly, this paradigm puts an end to the too-long-a-time it takes to finalise the end-state, inefficacious, unitary master plan as well as the top-down urban policy and plan-making processes in the country by splitting the urban planning and policy formulation process or activity into a two-tier approach, namely, a) Strategic/Broad Environmental Policy issues level, this will culminate in the preparation of Strategic Environmental Policy Plans for our new cities (and urban areas). These strategic environmental plans which are to provide contexts for the lower level or local action plans are also to indicate

action areas or provide broad criteria for determining action areas without defining their actual boundaries, b) Local Environmental Action Plans: these are to be action-oriented and detailed out; in other words, designs of finite sustainable schemes of localised development for immediate implementation. Both levels of plans are to be revised every three years at the least. The proposed two-tier urban planning paradigm is to allow for the speedy preparation and implementation of the type of plans involved so as to avoid the tremendous extra costs that characterised the implementation of the Abuja FCC Master Plan several years after its official lifespan had elapsed.

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**MINING, THE ENVIRONMENT AND
POST-MINING ACTIVITIES IN NIGERIA**

BY

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INTRODUCTION

ABSTRACT

Nigeria has vast mineral resources, many of which have been mined on commercial basis for quite a long time. These minerals have contributed significantly to the socio-economic development of the country, with oil and natural gas currently contributing over 80% to the country's foreign exchange earnings. Government policy in the last quarter century has been to revamp the solid minerals sector which had been neglected since the discovery of oil in the late 1950s. The exploitation of minerals leaves permanent scars on the environment and brings a host of other impacts; social, economic and health. This paper examines the impacts of mining on the Nigerian environment and its people, the problems associated with abandoned mines and the types of post-mining activities that have developed on the Jos Plateau. It is recommended that there is "need for integration of the mining sector with land use planning in Nigeria so that the goals of sustainable mineral resources management can be attained as well as the achievement of MDGs, especially those of poverty reduction and environmental sustainability".

Key Words

Mineral Resources; Mining; Environmental Impacts; Post Mining Activities; Integration of Mining with Land Use Planning.

INTRODUCTION

ABSTRACT

Nigeria is blessed with vast mineral resources (see Figure 1). Solid minerals, especially coal, tin, columbites, and limestone had played an important role in the socio-economic development of the country in the pre-colonial and colonial periods. From antiquity, solid minerals played a prominent role in the civilizations of pre-colonial societies in Nigeria. For example, the Nok Culture more than 2,500 years ago was based on iron-working; the Hausa kingdoms were noted for gold mining, and the Ife and Benin artistic civilizations were based on bronze works which flourished between 1163 to 1200, and 1630 to 1648 respectively (Mining Jrl, Feb 2006: 5).

From the late 1950s, following the discovery of oil and natural gas in Nigeria, these hydrocarbons became the dominant source of revenue and foreign exchange for the country. The solid minerals sector was then to suffer neglect and by the late 1970s, the coal and tin mining industries had virtually collapsed. The collapse of the solid minerals sector has left behind many problems, prominent of which are environmental problems arising from abandoned mines, orphaned mines and a host of post mining issues due to the mining methods and technologies used, weak legal provisions and poor enforcement of the existing laws and regulations.

From the mid 1980s through to the 1990s and into the present millennium, with the downturn in the national economy, low capacity utilization, increasing poverty, the country have witnessed growing restiveness, especially in the Niger Delta Region arising from concerns on the environmental damage caused by oil and natural gas exploitation. These problems led the government to embark on a policy of deregularization and diversification of the economy and a rekindled interest in the solid minerals sector. In 1985, the Federal Ministry of Solid Minerals Development (MSMD) was established (now the Federal Ministry of Mines and Steel Development, MMSD) and charged with the responsibilities of formulating policy for solid minerals sector, providing information and knowledge to enhance investment in the sector; regulating operations in the solid minerals sector generating revenue for the government, and safe-guarding the environment (see MSMD Brochure, **Making the Earth Work for You**). Although oil and natural gas remain dominant in terms of their contribution to government revenue (over 80%), and the GDP, (Dobbs 2003), the non-oil sector, including the solid mineral sector has witnessed some positive growth and contribution to the national

economy in recent years. (Table 1). Due to the zeal and priority being accorded to the solid minerals sector, the Federal Government declared 2007 as a **Year of Mines and Minerals**.

Table 1: Figures on Minerals Production in Nigeria, 2002

MINERAL	PRODUCTION IN TONNES (Except where otherwise stated)
Cassiterite	0.696
Limestone	9,283,177.5
Marble	6,081.6
Shale	523,689.65
Columbite	156
Tin	728
Barites	57,839
Feldspar	468
Coal	N/A
Gypsum	138,463
Iron Ore	7,850
Lead/Zinc	159,698
Phosphate	578
Kaolin	52,352
Clay	85191.2
Gemstone	11,375.11kg
Gold	365 Ounces
Aggregate and Stones	475,786.69
Granite	864,031,985 m
Red Alluvium	12.057
Dolomite	6,108
Tantalite	3,619.822
Silica Sand	10,135
Sand	72,043.34
Laterite	98,734.99

Source: Wardell Armstrong (2005) *Sustainable Management of Mineral Resources Project, Final report*

The paper examines the solid minerals sector in Nigeria and its environmental, health, social and economic impacts; post mining operations and the challenges these pose for physical land use planning in the country.

2. DEFINITION OF BASIC CONCEPTS: OPERATIONS AND ENVIRONMENT MINING, POST-MINING

a) Mining

Warhurst (1999) says that the term mining covers all aspects of metal production, including mine development, extraction, smelting, re-mining and waste management. So, mining is the process through which man wins minerals from the earth and turns them into valuable goods for his own use. One cannot imagine how the world would have been without minerals or indeed how we would live our lives without them. Minerals, for example, are the basis for our daily living, from the houses in which we live in to the cars we drive, the GSM handsets we use for communication and the computers, which have become the engine rooms for our daily work, for learning, research and pleasure.

The process of mining involves: Exploration, Exploitation (extraction), Processing, Re-mining, Waste management, Mine closure, Post-mining activities, etc.

We need to note that at each stage of the mining process, the environment is affected in one way or the other.

b) Post-Mining Operations

Mining is a temporary use of land. Mines are born; they mature, age and also die. So mining is of a transitory activity, which will pass over some day. Sometimes, mines are abandoned (orphaned) and then reworked again when conditions become suitable. Post-mining activities or operations are the uses/activities that take place after mines have been officially closed, abandoned or orphaned. The types of activities/operations that emerge depend on the characteristics of the site, the legal regime and policy requirements in place on the management of mined lands and the enterprise of the people in and around such areas. For example, in some countries, there are strong requirements on mined lands remediation; restoration and specific end-uses are stipulated. In countries where there are no legal requirements or enforcement procedures, post-mining activities would develop out of expediency, local situations and need.

Some post-mining activities/operations include: Agriculture, Tourism (based on mining heritage and landscape), Recreation, Fish farming. It also includes winning of alluvial leaches/rock wastes for construction purposes.

The winning of sand and other aggregates for construction purposes. Creation of Lakes, and water ponds being used as sources for domestic and industrial water supply. Diversification of the economy of mining settlements.

c) Environment

The concept of environment relates to the dynamic links (relationships) between man and his surroundings. This relationship is symbiotic, interdependent, vertical and horizontal and changes over time. Some have looked at it through the 'ecosystem', an approach where there is a continuous flow of resources, information and energy between man and his surroundings. Any change sends shock waves to the entire 'system'. The earth provides us with a variety of minerals, the mining of which causes major changes to the environment (both positive and negative) that can affect the GA, environment in very deleterious ways. Some of this damage can be temporary while others are permanent.

3. THE SOLID MINERALS SECTOR IN NIGERIA

Nigeria is richly endowed in minerals resources, oil and gas and a variety of solid minerals. There are about 34 different solid minerals in the country and these are located in various parts of the country. The former Minister of Solid Minerals Development (Oby Ezekwesili) had noted that solid minerals are found in more than 450 different locations in Nigeria (MSMD Brochure). Some of these include, tantalite, Kaolin, mica, barite, coal, gypsum, feldspar, gold, clays, limestone, columbite, cassiterite (tin), bitumen, lead, zinc, iron ore, marble, gemstones.

It should be noted, therefore that with the widespread distribution of these minerals, coupled with the zeal by the government to harness them, that associated environmental effects would arise whenever they are exploited.

Post-mining management of mines and mined lands require what they call "cradle to grave" management. This means that policies and management plans ought to be in place, even before the commencement of mining activities (pre-mining), on the management of mined lands and the kinds of end-uses that would follow.

Activities of the solid minerals sector are being run by the MMSD, which as earlier mentioned was established in 1985. The Minerals and Mining Act (MMA) of 2007 is the operational law on solid minerals mining in Nigeria. This has replaced the Minerals Act

of 1946 and the Minerals and Mining Decree of 1999. The law gives the Federal Government exclusive rights over ownership and control of all minerals in the country. This has been a source of controversy and even conflicts between the Federal Government on the one hand and the states and local governments on the other (especially on the issue of revenues derived from mining); and also between the Federal Government and the local communities where these minerals are found. States are required to establish State Mineral Resources and Environmental Management Committees, while agreements are required from communities where mining is to be carried out. The Act provides for environmental considerations and the rights of the host communities, offences and penalties, abandonment/closure plans, as well as reclamation and remediation of abandoned mines. Section 159 subsections 6 of the law stipulates that 'in case of abandonment or permanent cessation of production within the title area, the mineral title holder shall:

- a) Securely seal, fence, or cover every mine shaft and adit;
- b) Make safe all tailings and water retention areas; and
- c) Demolish, fence or lock all potentially hazardous buildings, structures, plants, and equipments'. Also under the Act, the

Mines Environment and Compliance Department is mandated to:-

- a) Review all plans, studies and reports required from holders of mineral titles in respect of their environmental obligations;
- b) Monitor and enforce compliance by holders of mineral titles with all applicable environmental requirements and obligations.
- c) Perform periodic environmental audits to ascertain that all regulations and obligations are being met by mineral title holders.

Section 115 provides that 'where land, which is subject to a mining lease, has been exploited, the mined out areas shall be restored by the applicant under the condition of its grant...'

The Mining and Minerals Act 2007 has also stipulated the need for EIAs to safeguard environmental protection and rehabilitation programmes, and the new mineral policy seeks to ensure that mineral resources are exploited in a manner that minimizes the social, environmental and economic consequences of mining (F.G.N. 2006).

The World Bank through MSMD is providing support through

finances for the sustainable management of mineral resources in Nigeria, which is anchored on:

- Strengthening governance and transparency in mining;
- Promoting private sector investment in the mining sector; and
- Economic development and diversification of artisan and small-scale mining for poverty reduction.

From the above, it is evident that relevant legislative and administrative frameworks for the management and enforcement of mining and post-mining activities in Nigeria do exist on paper. However, enforcement and implementation of the relevant provisions have been a problem as mining has caused (and is still causing) serious and widespread environmental damages in the country. These are examined briefly in the section that follows.

4. ENVIRONMENTAL, HEALTH AND SOCIO-ECONOMIC IMPACTS OF MINING.

Aigbedion & Iyayi (2007), in their recent paper on the '**Environmental effect of mineral exploitation in Nigeria**' have examined the environmental effects of mining in Nigeria, which include:

Air, land and water pollution

Air, land and water pollution occurs in the course of minerals exploitation, for example, from a large-scale exploitation of limestone and rocks used in the construction works.

Large volume of dust from the cement factories and mining operations in the Nigerian limestone quarries are discharged daily into the air. Similarly, a lot of air-borne particulate matters are generated by the numerous stone-crushing industries in the country. When the air is laden with such dust, it causes health hazards to many people. For example, pollution studies around Sagamu and Ewekoro cement works in Ogun State have shown that several people are suffering from eye pain, and asthmatic attack due to the dust-laden air that prevails within a few kilometers radius of the factories (Aigbedion, 2005).

Mining can also lead to heavy metal pollution such as zinc, magnesium, calcium, lead, mercury, etc which can get into food chain and affect human health (Duruibe, et al, 2007; Ogezi 2005). Oil spillage has caused extensive water and land pollution in the Niger Delta Region.

Damage of vegetation

Vast hectares of vegetation in form of natural forest or crop plantation have been lost due to mining. In the Jos Plateau, large amount of vegetation was stripped due to the open cast mining, and particularly in the riverine areas. This has virtually changed the landscape of the Jos Plateau, which is today a vast open grassland. Limestone and cement industries have also reduced the growth of Vegetation and crops like kola nuts within the vicinity of the factories due to the amount of dust that retards vegetative growth. In the Niger Delta, oil spillage has equally affected the growth of vegetation (Tolulope, 2004).

Ecological disturbance

Deforestation due to mining, oil spillages and noise from blasting can lead to ecological disturbance which affect the floral and faunal communities in such areas. The biodiversity of such areas is affected as well as the socio-economic basis of communities living in the region, as in the Niger Delta where plants, animals, soils and water are affected, resulting in the death of especially fish and other aquatic life, as well as small terrestrial animals, particularly those that feed on fish or lower plants. According to Aigbedion and Iyayi (2007), the soil gets soaked in oil and water is covered with oil, and consequently the ecosystem suffers not only disequilibria but also pronounced degradation with dire consequences on the food chain.

Degradation of natural landscape

Mining exploitation leads to the destruction of the natural landscape, creating open spaces in the ground and generating heaps of rock wastes, mine tailings that cannot be easily disposed off. This phenomenon is clearly exemplified on the Jos Plateau where tin and columbite mining has resulted in the destruction of the scenic landscape of the region and left behind over 1000 water ponds, lakes, alluvial heaps and widespread erosion (Ogezi, 2005, Dung-Gwom 1982, Brooks 1974).

Geological hazards

Mining operations normally upset the equilibrium in the geological environment, which may trigger off certain geological hazards such as landslide, subsidence, flooding, erosion and tremors together with their secondary effects. Some cases of subsidence and instability associated with drilling for oil and gas

from the subsurface reservoir have been reported in the Niger Delta. Subsidence has also been reported in the coal mines in Enugu and in other mine areas. Rock blasting can result in unpleasant conditions for people living closeby and also damage to buildings.

Socio-economic problems

The stoppage of mining activities imposed by depletion of the available reserves often lead to migration of people from the mining areas to other places. This may result in the formation of "ghost towns", which are abandoned towns and previous bubbling mining communities. This is a common feature on the Jos Plateau where hundreds, if not thousands of labour camps and mining settlements, have virtually disappeared or significantly declined (Mendie, 2010). Infrastructure in mined areas can also be left under-utilised where mining activities cease or decline.

Radiation hazards

Studies have shown that mine wastes (tailings) on the Jos Plateau have high radioactive elements, which could be very harmful to human health (Ogezi, 2005, Aigbedion 2005, Akaplisa (nd)). Such tailings are often used for construction of roads, houses or the radioactive waste could be washed into drinking water sources leading to 'mysterious' death of the consumers.

Professor Warhurst (1999) has categorized environmental effects of mining on the environment into those that affect the biophysical sphere (ecosystems, biodiversity, conservation, water, soils, forests); economic sphere (economic benefits, wages and salaries, taxes and royalties, livelihoods); and social sphere (rights of individuals and groups to organize, human health, cultural heritage-spiritual and cultural attitudes and behaviour).

5. POST-MINING ACTIVITIES/OPERATIONS AND THEIR ENVIROMENTAL IMPLICATIONS

The recent inventorization of mined lands in Nigeria by Ashawa Consult Limited for the MMSD found that there were a total of 1,224 sites that had been mined.

The distribution of the sites based on hazard priority showed that 48 (3.92%) of abandoned mine and quarry sites fell into the high Priority band, 217(17.73%) were in medium priority band, while 959 (78.35 %) of the sites fell into the low priority band. Physical hazards posed by abandoned mines were considerably higher than the chemical hazards (see Report by Ashawa Consult on **Inventory of**

Abandoned Mines and Quarries).

This gives an indication into the widespread distribution of mined sites in the country, and the likely nature and problems of post-mining activities in such areas.

Limpitlaw (2005), drawing examples from experience in South Africa, has advocated a holistic approach to closure planning for mines. Such an approach should include the following:

- An assessment of the economic viability of the plan, including the funding of post closure care and maintenance.
- Inclusion of the closure plan as part of a broader regional and economic development plans, relevant to the skills profile of the area which would allow the local community to fit into the plan.
- Post-closure land capability targets and related land use option(s) identified from the outset (pre-mining) with review during the operational phase of the mine, and
- An avoidance of creating a culture of dependency in the local community. This means that there should be closure plan from the very beginning in the life of a mine as well as clearly laid down procedures for mine closure. Before any post-mining operations, mine closure must ensure that mine sites are safe, physically and chemically stable, no future pollution risks are likely and that public health and safety are guaranteed. Post-closure would examine issues such as the management of soil resources after mining, how to endure and promote biodiversity, and how to deal with likely future risks arising from mine closure.

It is very doubtful whether there are clearly laid down mine closure regulations and procedures in Nigeria. Mines are abandoned when market conditions are not favourable and work resumes when such conditions are good. This has been the case on the Jos Plateau, at least where mining of tailings, tributing in the riverbeds and *loto?* mining continue to cause environmental problems in many localities.

Post-mining land planning need to determine as early as possible the economies of a proposal, which should be incorporated into the feasibility study and mine planning and should be specified in an Environmental Management Overview Strategy (EMOS).

Post-mining land uses may be divided into three broad groups, viz: Agricultural and forestry use, Nature conservation and enhancement, and other beneficial uses.

5.1. CASE STUDY OF POST MINING OPERATIONS ON THE JOS PLATEAU

On the Jos Plateau, open cast tin mining has not been a curse. The ponds provide water, which is used for horticulture and dry season irrigation for the cultivation of vegetables and a variety of other crops (Ihemgbulem, et al 1992, Phillips-Howard & Schoeneich 1992)). The Jos Plateau is noted for the production of Irish tomatoes, potatoes and other vegetables, which are consumed in the urban centres and also exported outside the region (Porter 1992a). The major problem has been on water management in many localities and the competing demands from other uses, domestic and industrial. The Nigerian Bottling Company and the Jos International Breweries, for example, harness their industrial water supply from some abandoned tin ponds.

Irrigation agriculture is quite extensive in areas that were once mined. The soils are poor in nutrients and organic matter, and the farmers had to apply tons of urban refuse and organic manure which could lead to sanitization and pollution of water (Alexander 1986).

Forestry has been another successful post mining land use on the Jos Plateau. Extensive areas of alluvial heaps were planted with eucalyptus trees, as is a method of land reclamation. The large areas of eucalyptus plantations have been designated as 'community forest reserves or 'government forest reserves'. These supply timber which is used for construction, building of houses, grass for thatching houses, and firewood, etc. These have not been effectively managed in the recent years and there has been an increasing case of bush burning and evasion by the Fulani as graze lands for their cattle.

The Rayfield Resort is an abandoned mine pond which has been developed for recreational purposes, with a bar, restaurant and some water sports. There are many such ponds that could be used for similar purpose to promote recreation and tourism. In fact, the mining landscape on the Jos Plateau coupled with its natural land forms could be developed and promoted for local and international tourism. At present, this is not the case.

Some fish farming is being done in many ponds by the local government and private fish farmers (former Joe Garba Fish Farm), for example. The problem is that most of the mine ponds are too deep and contain high levels of radioactive materials.

Within the Jos metropolis, many mine ponds and excavations have been used as sanitary landfills for the evacuation of urban waste and refuse. This has led to the reclamation of such ponds.

Many mining settlements along the major roads and those strategically located have become thriving small towns providing key services to their hinterlands (for example, Bisichi, Korot, Dorowa Babuje, Barkin Ladi, Jenta Kuru, etc (Potter 1992). With sound post-mining planning, therefore, some of these mining towns where mining has ceased, could be diversified and provided with alternative employment opportunities to the inhabitants instead of their moving elsewhere for jobs as has been the case in the past.

Other post-mining operations on the Jos Plateau are the winning of alluvial heaps, sands and clays for roads and housing construction.

6. CHALLENGES FOR PHYSICAL LAND USE PLANNING.

What are the implications of post-mining activities for physical land use planning in Nigeria? In what ways can the land use planning system contribute towards a better environment and the creation of viable communities after mining operations? How can the planning system contribute to sustainable mining that ensures the achievement of the MDGs on poverty reduction and environmental sustainability? Space and scope will not allow the author to do justice to these questions. However, these are issues for further research by town and environmental planners and managers in Nigeria.

Urban and regional planning is a profession that puts the welfare of people on the top of the environmental and sustainable agenda. It takes a holistic and comprehensive view of the environment and has developed robust methods, techniques and tools for environmental management, which should be applied to the mining industry in order to achieve sustainable mining. Some of which include:

EIA (Environmental Impacts Assessment)
SIA (Social Impact Assessment).
ERS (Environmental Risks Assessments)
ERM (Environmental Risk Management)
EMPS (Environmental Management Plans) (Cradle to grave management) Community Participation.

It is rather paradoxical that there is a very poor linkage between physical land use planning and mining in Nigeria. Mining control and regulations are totally outside the purview of land use planning control. This is not supposed to be the case. There should

be some integration in the development of regional and local policies and plans, the provision and maintenance of infrastructure and control of pollution. Planning control should, for example, be exercised in sensitive ecological areas, mines area large settlements, and on infrastructure plans and the maintenance of services. Post-mining activities should also conform to regional policies and local plans. It is not being advocated here that mining should be brought under direct planning control as in the case of the UK. However, it is being recommended that physical land use planning and town planners should play a more active role in the solid minerals sector to address some of the environmental, social, economic and post-mining land use issues that this paper has raised. The mining industry should adopt corporate social responsibility in its operations (Eweje, 2006), and should bear the environmental liabilities arising from mining (Dung-Gwom 2007). Mining should be built on the three pillars of sustainable development, environmental growth, economic balance and social progress.

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**EFFECTS OF ABANDONED CORKED OIL
WELLS IN IKOT ABASI
LOCAL GOVERNMENT AREA,
AKWA IBOM STATE,
NIGERIA ON THE ENVIRONMENT**

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INTRODUCTION
ABSTRACT

Abandoned oil wells pose serious pollution threats to the environment. These effects manifest in various forms such as land, water and air pollution and oil spillage. The entire ecosystem is affected. Nine abandoned oil wells were identified and are located at Ikot Obio Oko, Ikot Ada Udo, Ikot Akara, Atan Ikpe and Ikot Ndien. Others are located at Ikot Etetuk, Okpoto Ete, Ikot Akan and Ikwa. The total hydrocarbon content (THC) of the surface and subsurface soil samples ranged from 963.39 - 14510.65mg/kg and 845.66 - 11968.15mg/kg.

The high concentrations of total hydrocarbon (THC), effective cation exchange capacity (ECEC) and electrical conductivity (EC) in the soil are strong indications of oil pollution effects which impact high salinity to the soil and which could cause stress on Flora and Fauna. The results showed that soil, water, air and human beings are directly or indirectly affected by the abandoned oil wells. To realise the economic values of these abandoned wells as well as mitigate or enhance the socio-economic impacts, they should be farmed-out as a marginal field.

INTRODUCTION

1.1 Historical Overview

Effective oil exploration activities in Nigeria started in 1938 when Shell D' Arcy, now Shell Petroleum Development Company (SPDC) was given the sole concessionary rights covering the whole country. There was a halt in oil & gas exploration and production (E&P) activities occasioned by the outbreak of the Second World War. Resumed seismic activities after the war led to the discovery of oil in commercial quantities in 1956, at Oloibiri in Bayelsa State of the Niger Delta region. (Ndomas, 2005). With the participation of other companies, oil is being prospected in over 600 oil fields, in which approximately 240 are offshore and 360 are onshore (Gallum et.al. 2001).

Akwa Ibom State is one of the States in the Niger Delta region in which E&P for oil by SPDC began in the 1950s. The activities were widespread and concentrated on the onshore areas of the state. However, many of the oil wells which were drilled by then, have since been corked/sealed and abandoned without any recourse to whatever negative effects they might have on the environment. Such abandoned oil wells are found in Uruan Local Government Area (LGA), which have been the source of frequent dialogue between the people and SPDC. In Esit Eket LGA, there are two abandoned oil wells located at Ikpa and Etebi, all in Uquo Marginal field farmed - out to Frontier Oil Ltd. These abandoned oil wells were visited by the World Conference of Mayors during their one week conference hosted by Akwa Ibom State Government (The Providence, 2001). Other abandoned oil wells are found in Qua Iboe Marginal field Ibeno LGA and Mkpato Enin LGAs.

Shell Petroleum Development Company of Nigeria limited (SPDC) pioneered exploration for crude oil in Nigeria in 1937, but it was not until 1956 that oil was first discovered in commercial quantity in Oloibiri in Bayelsa State (Udotong, 1995; 2000) and first exported in 1958 (Ndomas, 2005). The company started exploration activities in Ikot Abasi Local Government Area (LGA) in 1974 (Udia, 2007). Unfortunately, some of its on-shore oil wells in Ikot Abasi LGA were abandoned because the oilfield was considered marginal (Udotong and Udotong, 2006). The environmental effects associated with these abandoned oil wells constitute the central theme of this study.

1.2 Statement of the Problem

Abandoned oil wells pose serious pollution threats to the environment. These effects manifest in various forms such as land, water and air pollution, oil spillage, and gas flaring. These can have devastating effects on the overall ecosystem. In a community like Ikot Abasi LGA where the majority of the people are involved in primary activities, pollution from the oil wells could have serious socio-economic effects on fishing, farming and health of the people. The six months incidence of continuous oil spillage and gas flaring from one of the abandoned oil wells at Ikot Ada Udo in the study area in 2007 resulted in serious environmental consequences, its effects are still being felt till date.

1.3 Aim and Objectives

The aim of the study is to examine the effects of abandoned corked oil wells on the environment of part of Ikot Abasi Local Government Area, the study area. Accordingly, the objectives of this study are to:

- (i) Determine the geographical coordinates of the abandoned oil wells in the study area,
- (ii) Identify and analyze air, water and soil contaminants if any, generated by the abandoned oil wells,
- (iii) Compare the quality of air, water and soil samples of the study area with those of World Health Organization (WHO) and Federal Ministry of Environment (FMENV) recommended minimum standards,
- (iv) Assess the effects of the identified contaminants on the environment, and
- (v) Proffer mitigative / ameliorative measures for the control of the effects of abandoned oil wells on the environment.

2.0 STUDY METHODOLOGY

2.1 The Study Area

Geographically, Ikot Abasi is located at the extreme south west of Akwa Ibom State between latitudes $4^{\circ} 30'$ and $40^{\circ} 4' \text{JQ}$ North of the Equator and longitude $7^{\circ} 30'$ and $7^{\circ} 45'$ East of the Greenwich meridian. It is bounded in the North by Oruk Anam LGA, in the south by Eastern Obolo LGA, in the east by Mkpata Enin LGA and in the west by Imo River. Ikot Abasi LGA lies within the tropical climatic zone, with two dominant seasons, the wet and dry seasons. These climatic regimes and location imparts on the coastal vegetation

which is mainly mangrove forest. The soil type is mainly alluvial and the rock type is mainly sedimentary. It is largely drained by Imo River and Essene creeks.

Ikot Abasi Local Government Area is the study area. This area had previously been known as Opobo, Egwenge and Ibekwe (Jones, 1956). A century ago, it was a flourishing export trade centre mainly on items such as palm oil and slaves (ALSCON, 1997 a). The Royal Niger Company, United African Company, Lever Brothers, African Traders' Association, F and A Swanzy, Macluer, G.L. Gaiser and Company, etc, were the early European trading companies that established their factories in the area (Lovering, 1915). Relics of some of these factories still adorn the area's landscape. However, following the discovery and exploration of coal at Enugu and the construction of Port Harcourt- Enugu railway line, the companies re-directed their attention to Port Harcourt leading to the decline of economic activities in the area. (Isichei, 1976). The Second World War further aggravated the situation (ALSCON, 1997a). The subsequent closure of the trading port meant that the area was no more to be relevant in the economic equation of Nigeria (Udo-Inyang, 1985). The discovery of oil in Ikot Abasi LGA brought new hope to the area. This hope led to frustration as the oil wells were rather corked and abandoned than exploited by SPDC. The dwindling fortune of the area persisted for decades until the establishment of Aluminum Smelter Company of Nigeria (ALSCON) in 1990.

2.2 Field Data Gathering

The geographical coordinates of the nine abandoned oil wells which were numbered from 1-9 were obtained using the Global Positioning System (GPS) (Model: Garmin 60). Other primary data were obtained around the nine abandoned oil wells. Effects of these abandoned oil wells on land, water and air were measured within 1Km radius from each oil well. Residents within this radius were interviewed using a structured questionnaire on their experiences which are likely to be caused by the abandoned oil wells. Such experiences included effects on farmlands/crop yields, fishing output, and health. Both the experimental and survey methods were applied in the study, for the analyses of the chemical contents of water samples, soil samples and air quality and to obtain information on the socio-economic effects on the residents. All samples were taken within the defined radius (spatial boundary) of each of the nine abandoned oil wells on a hundred per cent sampling frame.

The phenomenological survey approach (Bannister and

Fansella, 1980; Huczynski and Mmobusi, 1985) was applied in the study. This survey technique relies on the quality, rather than quantity, of selected respondents who were knowledgeable enough in the subject matter being investigated. An important aspect of this survey technique is the relatively small number of respondents to be interviewed compared to the positivist approach. Accordingly, ninety respondents were selected and interviewed.

2.3 Samples Collection

a. Soil Samples

Soil samples were collected within the defined spatial boundary of the nine abandoned oil wells, using a hand-held Auger at the depths of 0-15cm and 15-30 cm. The samples were bagged, labeled and taken to the laboratory for analyses.

b. Water Samples

Water samples were collected from water bodies within the defined spatial boundary of each of the nine abandoned oil wells. Each water sample was collected and stored in clean four litres plastic containers with cover.

c. Air Quality Measurement

Air quality data collection of the chemical constituents of atmospheric pollutants such as Suspended Particulate Matter (SPM), CO_x, NO_x, SO_x and Hydrocarbons, at each air quality sample location within the defined spatial boundary of each oil well were measured in - situ using GC Gas Monitors (Sensitive digital gas monitors).

2.4 Samples Analyses

a. Soil Sample Analyses

They were air-dried and served to pass through 2 mm mesh. Five per cent sodium hexameta-phosphate was used as soil dispersing agent. Hydrogen peroxide (Hi Oi) was applied to destroy organisms in the samples. All samples were labelled and stored in poly bags accordingly for the determination of such parameters as pH and organic carbon. Chemical and physical properties of the soil samples were determined using routine laboratory procedures.

The pH value was determined in 1:2 soil to water ratio using a glass electrode pH meter (model TW 3320, manufactured by Jenway,

Proton - Witter Amsterdam).

Electrical conductivity:

In a 1:2 soil to water extract at 25°C, the soil conductivity was measured using conductivity meter (model EA 4501 - Ag, manufactured by Eijkacamp Agrisearch Equipment, Giesbeek, the Netherlands) according to the method of **Jackson (1962)**.

Total Hydrocarbon Content (THC) and Total Organic Carbon (TOC)

THC was extracted and measured using spectrophotometer (Janway model) while total organic carbon (TOC) was measured using the method of Walkley and Black (1989).

Nitrate (NO₃ - N)

This was determined using brucine calorimetric method according to the methods of the Association of Official Analytical Chemists, AOAC (1990).

Phosphate (PO₄⁻)

PO was determined using the molybdate blue calorimetric method (Murphy and Riley, 1962).

Sulphate (SO₄²⁻)

Sulphate was determined using turbidimetric method according to the methods of AOAC (1990).

Trace and Heavy Metallic ions were extracted by wet oxidation method using a mixture of perchloric (HC104) and nitric acids (HNO₃). Heavy metals such as copper, Iron, lead, zinc, cadmium, chromium⁶⁺ and nickel, were determined in the extract using Perking Elmer atomic absorption spectrophotometer model 403B, Essen Germany. The values obtained in all the above analyses were compared with WHO standard values to determine the levels of pollution if any.

b. Water Samples

Elemental and chemical properties of the samples were analyzed using Gallenkamp flame analyzer (model F.G.A-33-C) and atomic absorption spectrophotometer (model PYE UNICAM SP 2900) respectively. Titrimetric and observatory methods were used

in determining some physical properties of the water samples. The pH values were obtained using pH meter. All the values obtained in the analyses were compared with the WHO standard values to determine the levels of pollution of the various samples.

Analyses of Elemental Contents:

Elemental analyses were done to determine the contents of Sodium, Potassium, calcium, Iron, Manganese, Magnesium, Copper, Lead, and Cadmium in the various samples. Gallenkamp flame analyzer (Model FGA 330-C) was used for the determination of sodium and potassium contents. For all other elements, atomic absorption spectrophotometer (model PYE UNICAM SP 2900) was used. All the values were expressed in parts per million.

Analyses of Chemical Properties

The chemical properties of the water samples were analyzed to obtain the pH value which was to ascertain the acid or alkaline contents of the samples. The chemical content values were also analyzed for Dissolved Oxygen (DO), alkalinity (as measured by calcium carbonate (CaCO₃) content), ammonium nitrogen (as Nitrogen, N content) and Ammonia (as NH₃). All measurements were in milligrams per litres.

Analyses of physical properties

The analyses of physical properties of the water samples were to determine the Temperature, Appearance, Total Dissolved Solids (TDS) and Hardness of the samples. The temperature of each sample was taken and the appearance observed with the naked eye before the analyses for the Total Dissolved solid and Hardness of the samples were undertaken.

c. Air Quality Measurement

In each Air Quality sampling station, sampling lasted for eight hours per day. Readings in each parameter were taken every two hours, with variations such that the readings were taken from eight o'clock in the morning to eight o'clock in the night for a week. The sensors were positioned to a height of about two meters in the direction of the prevailing south-west monsoon wind, in all cases.

Suspended Particulate Matter (SPM)

A Cole Farmer APC plus Airborne counter was used in measuring suspended particulate matter (SPM). The instrument is

composed of four modules: the sensor, pump, battery and electronics. The counter measures precisely the quantity of airborne particles with sizes above a set of fixed particle size of 0.3 μm , 0.5 μm , and 5.0 μm . It also provides, simultaneously, temperature, relative humidity, sample time and date of data.

Carbon Monoxide (CO)

An ELE carbon monoxide gas monitor model 463-022 was used for the detection of CO. The range of detection was between 0-100 ppm with alarm set at 50 and 150 ppm.

Oxides of Nitrogen (NO_x): An ELE Nitrogen and Nitrogen Dioxide Gas Monitor models 463-024 and 463-026 respectively were used for the detection of NO_x . The range of detection was between 0- 1 00 Ppm with alarm set at 2 and 6 ppm. The sensors were held to a height of about two meters above the ground level, in the direction of the prevailing wind and readings recorded accordingly at stability.

Oxides of Sulphur (SO_x)

An ELE Sulphur dioxide gas monitor model 463-036 was used for the detection of SO_x . The range of detection was between 0-100ppm with alarm set at 2 and 6ppm. Measurements were done by holding the sensor to a height of about two meters above the ground level in the direction of the prevailing wind. Readings were recorded at stability.

Methane (CH_4)

A Defender multi-Gas Detector, model D2-2000, manufactured by DW Technologies was used for the determination of methane gas, on a detection range of 0-100% with alarm set at 5%. The limit of detection is 0.01%. The sensor was held to a height of about two meters above the ground level in the direction of the prevailing wind and readings recorded at stability.

Volatile Organic Carbons (VOC)

A Multi RAE Plus (PGM-50), a programmable Gas Monitor was used to monitor organic vapours. It has a photo-ionization Detector (PID) using 10.6-11.7ev gas discharge lamp. It includes an integrated sampling pump -a diaphragm O and pump providing about 250 cc per minute flow rate at height 5% setting. It measures VOC over two ranges 0-200 ppm with a resolution of 0.1ppm and

200-2000 mm with a resolution of 1 ppm.

Wind Speed and Direction

Digital hand held ELE Model 460-050 wind speed indicator was used to ascertain the wind speed at the various locations. The equipment determines the wind speed via wind cups that generate on revolution signal that is directly proportional to the wind force. The instrument was held to a height of two meters above the ground level in the prevailing wind direction and readings taken. Compass Model M-73 was used to determine the wind direction.

Noise and Vibration Level

A Cole Partner Extec model 407736 sound level meter was used to measure the noise level at each location. Measures were undertaken by directing the probe towards the direction of the prevailing wind and readings recorded at stability.

Quality Assurance/Control Procedure

Strict quality assurance procedures were adopted in all aspects of the study, including sampling, laboratory analyses and results documentation as recommended in DPR Guidelines and Standards (Part VIII) section 2.0 (1991). For each of the abandoned oil wells, a control point was established outside 50 meters radius of each well. The control stations and oil wells were labeled as follows for ease of identification. LO = Control Station, L1 = Ikot Obio Oko, L2 = Ikot Ada Udo, L3 = Ikot Ika, L4 = Atan Ikpe, L5 = Ikot Ndien, L6 = Ikot Etetuk, L7 = Okpoto Ete, L8 = Ikot Akan, L9 = Ikwa.

3.0 RESULTS AND DISCUSSION

3.1 Geographical Coordinates of the Nine Abandoned Oil Wells

The geographical coordinates of the nine abandoned oil wells which were numbered from 1-9 using the Global Positioning System (GPS) were presented on. The nine abandoned corked wells were identified and they are located at Ikot Obio Oko, Ikot Ada Udo, Ikot Akara, Atan Ikpe, and Ikot Ndien. Others are located at Ikot Etetuk, Okpoto Ete, Ikot Akan and Ikwa.

Sulphate (SO₄²⁻)

Sulphate concentration at top soil ranged from 35.65-53.65

mg/kg with a mean value of 38.18 and an average of 45.12 mg/kg for the control stations. The sub soil values ranged from 35.32-53.32 mg/kg with a mean value of 37.72 and an average of 43.16 mg/kg for the control station.

Calcium (Ca⁺)

The top soil concentrations of calcium were between 289.10 mg/kg and 367.13 mg/kg with a mean concentration of 323.30 mg/kg. The control value was 432.0 mg/kg. The sub soil concentrations were between 215.30 and 497.59 with a mean of 748.41 mg/kg and an average of 521.00 mg/kg for the control locations.

Potassium (K)

Potassium levels at the top soil ranged between 655.35 and 979.30 mg/kg with a mean of 792.15 mg/kg and an average of 1056.10 mg/kg for the control locations. The sub soil concentrations were between 596.70 and 878.35 mg/kg with a mean of 748.41 mg/kg and an average of 992.00 mg/kg for the control locations.

Sodium (Na⁺)

Sodium concentrations at the top soil were between 62.30 and 66.80 mg/kg, a mean of 64.05 and an average of 67.0 mg/kg for the control stations. The sub soil values were between 55.16 and 63.60 mg/kg with a mean of 59.10/ mg/kg and an average of 80.00 mg/kg for the control locations.

Trace and Heavy Metallic Ions

Trace and heavy metallic ions were determined using the method earlier discussed. The figures discussed below and presented in Table 2 represent the average values of both top soil and sub soil samples for each of the nine abandoned well sites.

Copper (Cu)

The values of copper concentration were between 6.27 and 6.57 mg/kg. The mean value for the nine locations was 6.48 with 7.25 mg/kg average at the controls.

Iron (Fe)

The values of iron concentration were between 9101.70 and 10621.80 mg/kg with a mean of 9855.47 mg/kg and 11261.00mg/kg average of the control stations.

Zinc (Zn)

The levels of zinc concentration varied between 7.31 mg/kg and 9.62 mg/kg with an average value of 12.07 mg/kg for the control stations, and 8.41 mg/kg mean for the nine locations.

Cadmium (Cd)

Cadmium concentration varied between 1.27 and 1.30 mg/kg with a mean of 1.29 and an average value of 0.30 mg/kg for the control stations.

Chromium (Cr)

Chromium concentration was the same in all the nine abandoned oil wells soil samples and the control stations, all having a value of 50.00 mg/kg.

Nickel (Ni)

Nickel concentration varied between 13.10 and 22.80 mg/kg with a mean of 17.69 and a control average of 0.20 mg/kg.

Lead (Pb)

The concentration values for lead varied between 32.10 and 38.50 mg/kg with an average of 69.40 mg/kg for the control stations and a mean of 35.53mg/kg.

In general, the high concentration of nickel, though it has not yet reached alarming level, may be due to other industrial activities, in the study area. On the other hand, the high concentration of hydrocarbon with a mean top soil and sub soil values of 6287.14 and 5596.38mg/kg respectively are above the DPR recommended limit of 50 mg/kgs which an indication of hydrocarbon contamination resulting from the abandoned oil wells. On the whole, the concentrations in other parameters were generally within acceptable limits.

The mean soil pH value at the top soil and sub soil levels was 5.45 and that of control stations at both levels was 6.4 indicating strong to moderate acidity, which could have adverse effects on soil flora and fauna (Odu, 1972; Harvey, 1997). The mean total organic carbon at both soil levels was 4.86% and that of control locations was 3.55%. These values are high, but the higher values were at locations LI, L2 and L6. These were Ikot Obio Oko. (5.10-5.32); Ikot Ada Udo (5.1-5.32); and Ikot Etetuk (4.92-5.01%) respectively, which were indicative of oil spill effects.

The concentrations of total hydrocarbon content in the soil

samples with mean values of 6287.14 (top soil) 5596.38(sub soil) are high compared with the mean control values of 233.51 (top soil) and 196.54 mg/kg (sub soil). However, the higher values particularly at L1-L4 ranging between 11321.66 and 14510.65 at top soil and between 11016.26 and 11968.15mg/kg at the sub soil level are indicative of previous oil spill.

3.3 Water Quality

The importance of good quality water to life was re-echoed recently by *Awake Magazine* (2009). Negative aspects of it signify adversity. Its total lack, inadequacy or poor quality impacts directly or indirectly on human health and economic endeavour (Ekop, 1994, Doornkamp, 1992). Thus, water is of both economic and social importance. Human activities such as road construction, farming, gas flaring, oil spill, industrialization and natural causes such as flooding, erosion and landslide could have direct or indirect effects on the quality of water. While these other effects are recognizable, we are more concerned here with effects which are directly or indirectly induced by the abandoned oil wells in the study area. Water samples were collected within 50 meters radius of four abandoned oil wells at randomly selected locations, namely:

Elemental Properties

Water samples from the above locations were collected and analyzed for the contents of magnesium, calcium, potassium, iron, lead and zinc, and the values expressed in mg/l. The values for magnesium varied between 11.76 and 12.51 mg/l with a mean of 12.21 and a control value of 36.50 mg/l. Calcium concentration was between 31.26 and 86.40 mg/l with a mean value of 64.89 and a control value of 97.8 mg/l. Potassium varied between 1.26 and 9.89 mg/l with a mean of 6.18 and a control value of 14.5 mg/l. Iron concentration was 1.43 mg/l for all the locations and 0.05 mg/l at the control. The concentration of lead varied between 0.07 and 0.20 mg/l with a mean value of 0.12 and a control value of 0.04 mg/l. The concentration of zinc was the same in all the samples and control locations at 0.02 mg/l (Table 4).

Chemical Properties:

Samples from the four selected water points and that of the control location were analyzed. The pH values varied between 8.30 and 8.35 with a mean value of 8.32 and control of 8.30. Electrical conductivity varied between 15.63 and 17.50 us/cm with a mean value 16.38 and 0.23 us/cm at the control. The values for total suspended solid varied between 408.00 and 661.00 mg/l with a mean value of 544.50 and a control value of

Table 4: Elemental Analysis of water samples in the study area (in mg/l)

S/N.	PARAMETERS	SAMPLE LOCATIONS				MEAN	CONTROL LOCATION
		L2	L4	L6	LS		
1.	Magnesium	11.76	12.46	12.51	12.11	12.21	36.50
2.	Calcium	31.26	79.31	86.40	62.57	64.89	97.80
3.	Potassium	1.26	7.45	9.89	6.12	6.18	14.50
4.	Iron	1.43	1.43	1.43	1.43	1.43	0.05
5.	Lead	0.20	0.12	0.07	0.09	0.12	0.04
6.	Zinc	0.02	0.02	0.02	0.02	0.02	0.02

Source: Field Survey by Authors (November, 2010)

380.00. Total hydrocarbon varied between 23.11 and 24.76 mg/l with a mean of 23.90 and a control of 20.10 mg/l; and turbidity between 24.45 and 24.55 mg/l with a mean of 24.50 and a control of 15.83 mg/l. The total acidity ranged between 296.00 and 371 mg/l with a mean value of 330 mg/l and a control value of 269.0 mg/l. The total alkalinity concentrations were

between 25.33 and 28.0 mg/l with a mean of 26.91 and a control value of 42.07mg/l. Dissolved oxygen concentrations were between 2.60 and 12.80 mg/l with a mean value of 8.98 and a control of 12.93 mg/l, and those of biochemical oxygen demand were between 6.30 and 6.86mg/l with a mean of 6.48 and control value of 6.50 mg/l. Chloride ion values ranged between 22.50 and 22.60 mg/l with a mean value of 22.53 and a control concentration of 21.50 mg/l. (Table 5).

Table 5: Chemical Analysis Of Water Samples In The Study Area

S/N	PARAMETERS	SAMPLE LOCATIONS				MEAN	CONTROL LOCATION
		L2	L4	L6	L8		
1.	pH	8.35	8.31	8.30	8.31	8.32	8.30
2.	Electrical Conductivity (us/cm)	17.50	15.97	15.63	16.42	16.38	0.23
3.	Total Suspended Solid (TSS) (mg/l)	661.00	586.00	408.00	523.00	544.50	380.00
4.	Total Hydrocarbon (THC) (Mg/l)	24.76	23.17	23.74	23.11	23.90	20.10
5.	Turbidity (mg/l)	24.55	24.45	24.55	24.45	24.50	15.83
6.	Total Acidity (mg/l)	296.0	342.0	371.0	311.0	330.0	269.0
7.	Total Alkalinity (mg/l)	28.00	26.91	25.33	27.41	26.91	42.07
8.	Dissolved Oxygen (mg/l)	2.60	10.60	12.80	9.93	8.98	12.93
9.	Biochemical oxygen Demand (BDD) (mg/l)	6.86	6.47	6.30	6.30	6.48	6.50
10.	Chloride (Cl)(mg/l)	22.60	22.50	22.50	22.50	22.53	21.50

Physical Properties

The physical properties of water samples which were measured included temperature, total hardness, total dissolved solids and appearance.

The temperature ranged between 29.07 and 29.43°C in the four samples with a mean of 29.24°C and a control of 260°C. These values were within WHO (1989) and FMENV (1991) range of 27°C - 29.5°C. All the water samples including control sample were not clear and had particles in them. The total dissolved solids (TDS) varied between 271.60 and 292.00 mg/l with a mean value of 283.04 mg/l, which is within WHO and FMENV standards of 200 - 500 mg/l and 500 mg/l respectively, suggesting that the water bodies as per this parameter, were suitable for domestic use and aquatic life (USEPA, 1986). The control sample value was 1021.0

Table 6: Physical Properties of Water Samples in the Study Area

S/N	PARAMETERS	SAMPLE LOCATIONS				MEAN	CONTROL LOCATION
		L2	L4	L6	L8		
1.	Temperature (°C)	29.43	29.15	29.30	29.07	29.24	26.0 °
2.	Appearance	Coloured	With	Visible	Particles		Coloured with particles
3.	Total Dissolved Solids (IDS) (mg/l)	271.60	287.55	292.00	281.01	283.04	1021.0
4.	Total Hardness (mg/kg)	41.35	42.10	42.30	41.86	41.90	53.24
5	Ammonia (ppm)	8.6	8.6	8.6	8.6	8.6	8.5
6	Non Methane Hydrocarbon	39.02	39.02	39.02	39.02	39.02	33.09

Source: Field Survey by Authors (November, 2010)

mg/l. The total hardness of the samples varied between 41.35 and 42.30 mg/l with a mean value of 41.90 mg/kg. These values were within the WHO and FMENV recommended standards of 10.0 - 50mg/l. The control sample value was 53.24 mg/l (Table 6).

The air quality was moderately clean and fairly free of gaseous pollutants. However, the high value of carbon oxide in location L6-21.0ppm is higher than the WHO standard of 10-20 ppm, though lower than FMENV value of 30ppm, and the value of non methane hydrocarbon -39.02 mole at the four sample locations and 33.09 mole at the control location could be attributed to crude oil effect on the environment. Hence, the abandoned oil wells in the study area have impacted negatively on the quality of air, though at the moment of study, have not reached alarming level.

The effects on the quality of air manifested on the fast rate at which zinc house roofs were rusting and on the number of the people who suffered from any death and other related ailments.

3.4 Socio-Economic Effects

Ninety household heads at ten households per the abandoned nine oil wells area were purposely selected on the basis of their knowledge of the subject matter under study. They were interviewed using structured questionnaire on their knowledge of the probable effects of the abandoned corked oil wells on their environment, particularly on water, soil, air and their health. Respondents (88.9%) who said 'YES' were unanimous in the observable changes in the quality of water which included colour, suspended particles, taste and oily appearance. There were some respondents who said 'NO' (7.8%) that there were no changes in their water and there were still those who "did not know" (3.3%) whether there were changes or not (Table 8).

Table 7: Air Quality Analysis in the Study Area

S/N	PARAMETERS	SAMPLE LOCATIONS				MEAN	CONTROL
		L2	L4	L6	L8		
1	Suspended Particulate Matter (SPM) (ppm)	126.0	122.5	120.6	124.5	123.4	111.4
2	Sulphur Oxide (ppm)	12.0	12.0	12.0	12.0	12.0	12.0
3	Nitrogen oxide (ppm)	87.5	91.7	93.0	89.7	90.48	110.0
4	Carbon oxide (ppm)	15.0	15.0	21.0	15.0	16.50	15.0

Table 8: Observable Changes in Water Quality by Respondents

	OBSERVABLE CHANGES				Total	% Total
	Colour	Particles	Taste	Oily		
YES	S	/	/	S	80	88.9
NO	-	-			7	7.8
DONT KNOW	X	X	X	X	3	3.3
Total					90	100.0

Changes were also observed in air quality and the effects manifested on the fast rate of the rusting of zinc house roofs. Another possibility of the cause of this problem could be gas flaring in the neighbouring towns. Seventy respondents (77.8%) said 'Yes' there were changes in the air quality, fourteen (15.5%) said there were 'No' changes while six (6.7%) 'Did not know'.

Observable changes were also noticed on the soil quality. The respondents who were primarily farmers complained of low yields in crops, particularly in cassava and yam. Eighty-five respondents (94.4%) said 'Yes' that their farms and fishing activities were affected, five (5.6%) said 'No' that theirs were not affected. There was no 'don't know'. (Table 9).

Table 9: Observable Effects on Air and Soil Qualities by Respondents

	EFFECTS ON AIR QUALITY	EFFECTS ON SOIL QUALITY
	No. of Respondents	No. of Respondents
YES	70 (77.8%)	85 (94.4%)
NO	14 (15.5%)	5 (5.6%)
DON'T KNOW	6 (6.7%)	0 (0.0%)
Total	90 (100%)	90 (100%)

Source: Field Surveys by Authors (November 2010)

Information was obtained from Ikot Abasi General Hospital on the probable diseases and other environmental health problems that could be attributed directly or indirectly to the abandoned oil wells. At this point a greater concern was the after effect of the 2007 six months continuous oil spillage and gas flaring from one of the oil wells at location L2-Ikot Adaudo and also the effects on human health from other locations. Records obtained between 2006-2008 showed that there were 129 (35.8%) reported cases of malaria, 81 (22.5%) cases of typhoid fever, 53 (14.7%) cases of cholera, 42 (11.6%) of dysentery, 37 (10.4%) of respiratory diseases and 18 (5.0%) of other related ailments (Table 10).

Table 10: Health Problems Directly or Indirectly Attributed To the Effects of Abandoned Oil Wells

S/N	HEALTH PROBLEM	NO. OF PATIENTS	% TOTAL
1	Respiratory diseases	37	10.4
2	Dysentery	42	11.6
3	Typhoid fever	81	22.5
4	Cholera	53	14.7
5	Malaria	129	35.8
6	Others	18	5.0
	Total	360	100.0

Source: General Hospital, Ikot Abasi (2006-2008)

The socio-economic effects of the abandoned oil wells on the inhabitants of the study area were also measured. Farmers complained of low crop yields, particularly in cassava and yam, which were indicative of polluted farm lands while the fishermen and women complained of low catches.

In summary, this study was concerned with the effects of abandoned oil wells on the environment of the study area. The results showed that soil, water, air and human beings were directly or indirectly affected by the abandoned oil wells. The high concentrations of total hydrocarbon (THC), effective cation exchange capacity (ECEC) and electrical conductivity (EC) in the soil are strong indications of oil pollution effects which impact high salinity to the soil which could cause stress on flora and fauna.

Water samples showed higher concentrations of total dissolved solids (TSS), total hydrocarbon (THC), turbidity, chemical oxygen demand (COD) and biochemical oxygen demand, than the WHO recommended standards. These are the adverse effects of oil on the water of the study area.

The effects of gas flaring in the neighbouring areas were felt on the zinc roofs in the study area. The socio-economic effects manifested in poor farm yields, low fishing activities and some human health implications.

RECOMMENDATIONS

The following recommendations are made:

1. Immediate full exploitation of the abandoned oil wells should commence, in which case adequate environmental management strategies would be put in place to avoid further adverse effects on the environment.

2. The Ministry of Health should monitor, on regular basis, the health implications of the existing oil wells on the inhabitants of the area and put forward a regulatory medical framework to stop further effects on the people.
3. Existing national and international laws concerning hazardous waste should be enforced by the State Ministry of Environment.
4. Frequent Environmental Impact Audit should be conducted to ascertain the impacts and predicted effects.
5. Shell Petroleum Development Company (SPDC) should be held liable to any environmental deterioration and health risks arising from the abandoned oil wells.

CONCLUSION

The abandoned oil wells have contributed immensely to the deteriorating state of the environment and health of the people in the study area. The abandoned oil wells cannot be of any economic value until they are exploited. Their abandonment constitutes serious environmental problems and health risk to the people of the study area. The implementation of the recommendations will reduce the adverse effects of abandoned corked oil wells on the environment.

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**INTERGOVERNMENTAL RELATIONS AS
A STRATEGY FOR THE EXECUTION OF
PHYSICAL DEVELOPMENT PLANS
IN ENUGU STATE OF NIGERIA**

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INTERGOVERNMENTAL RELATIONS AS A STRATEGY FOR THE EXECUTION OF PHYSICAL DEVELOPMENT PLANS IN ENUGU STATE OF NIGERIA

Abstract

This study investigated the place of intergovernmental relations to revitalizing the physical development efforts in Enugu State of Nigeria. It was with a view to finding out if the failure and/or abandonment of physical development projects is as a result of not maintaining intergovernmental relations. The sample frame of the study included consultation with officials in town planning matters, relevant ministries and parastatals, communities and other concerned international agencies. Proportionate stratified random sampling was used in selecting the various populations studied. Data collected were based on agencies involved in projects execution, the number of projects executed as well as the funds released for such projects for the period under study. Multiple regression analysis was used in the data analysis. The use of the model was to ascertain the magnitude and significance of relationship among given variables. The test was performed at 5% level of significance. The analysis revealed that intergovernmental relations on implementation of physical development projects did not exist in Enugu and, therefore, advanced measures for efficiency, of which is the institution of intergovernmental co-operations in the state at state, regional and local levels.

Key words: Intergovernmental Relations, Development Projects, Fund Release, Regional Level.

Introduction

For centuries of human existence on earth, man has put much effort into getting the best out of the earth. Much of the efforts, which varies in form and intensity from one nation to another, revolve around two major issues, namely, improving the total national output so that the basic necessities of life such as food, shelter and health services may be available to all; and providing a framework and environment that are conducive to the pursuit of higher goals at individual, corporate and national levels. Various theories and models have evolved over the years to tackle these issues. In Nigeria, for instance, efforts at inducing developments date back to the colonial period. Such efforts, since the Second World War, include the Ten-year Integrated Development Plan for 1946-1956, the Development Plans for the periods 1962-1968; 1970-1974; 1975-1980; 1981-1985 and the National Rolling Plans from 1990 to date. These efforts, according to Obialo (1999), are not really physical development planning experiences, but financial allocations for development projects. They were, however, often articulated to achieve various laudable objectives for the overall interest of the citizenry.

The net problem associated with the development plans is non-realization of objectives within the time frame. This has led to a number of projects remaining uncompleted years after the target period. In Enugu State, for example, most parts of the rural areas exhibit appreciable poverty, which results from lack of such basic infrastructure as roads, electricity, health and educational facilities. This is even when their provision had been provided for in the yearly budgets.

The problem addressed in this study, therefore, was that despite well-articulated and goal-oriented physical development plans specified in the yearly budgets of Enugu State, there is scarcely physical manifestation of the projects. Some of the projects are either commenced or abandoned or are never commenced at all after approval. Few completed ones are never realized within target periods. There appears to be lack of adequate cooperation and coordination among stakeholders. It is the desire for progress and the need to address this problem of development that has led to the urge to carry out regional physical development planning of the state alongside a model of interrelationships of relevant government agencies and other stakeholders.

It was hypothesized that intergovernmental relations on implementation of physical development projects do not facilitate achievement of objectives. The intergovernmental relations were measured by the scale of involvement of different tiers of government. Implementation of physical development projects was measured by the number of physical development projects implemented. Financial commitments for those physical development projects were measured by the percentages of the money released for those projects. The need for this hypothesis is to ascertain which model should be emphasized more in project execution. This was with a view to providing a clear basis for drawing a conclusion on the functioning of intergovernmental relations in Enugu State.

Review of Related Literature

Intergovernmental relation (IGR) is defined as an important body of activities or interrelations occurring between governmental units of all types and levels within the Federal System (Anderson, 1960). Incidentally, the issue of interrelations between and among governments at international, national and local levels is an old one. Some of such interrelations come about in most informal ways while others are formal. In the formal sense, the interrelations are duly institutionalized through some forms of written treaties of differing magnitudes. For example, there have been treaties at international and other levels. Most of such treaties, however, according to Grenville (1973), have been concerned with economic and social questions.

Treaties include single state, bilateral and multilateral treaties. Bilateral treaties are those between two states (nations), while multilateral treaties are concluded among three or more states (Grenville, 1973). One important observation made by Grenville was that, even though there has been an increase in the number and length of treaties due to increase in the number of sovereign nations, the general intentions of friendship and co-operation embedded in the language of the treaties are no guarantee of observance.

Ofoegbu (1980) worked on public international institutions and organizations and referred to them as inter-government organizations (IGOs). He observed that the organizations have grown both in number and in scope of activities and functions which they cover. Apart from economic and social questions, as observed

by Grenville, Ofoegbu gave a number of other spheres covered by the activities of the IGOs. They include food, military and security, health, culture and communication, judiciary and politics. Under the economic sphere, there are such institutions as the International Monetary Fund (IMF), the United Nations Conference on Trade and Development (UNCTAD), and the various economic commissions for Africa and Latin America. Under food, there is the Food and Agriculture Organisation (FAO), under health, there is the World Health Organisation (WHO) and under culture, and communication, there are the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the International Postal Union. Under judicial matters, there is the International Court of justice (ICJ), while under the political sphere, there is the League of Nations.

None of the International bodies as mentioned above, apart from the physical manifestation of implemented policies, is directly linked with planning of the physical environment. However, the lesson remains that such bodies form the brain child of interrelations among different world nations. However, more recently, and at a more localized arrangement, relative to the international sphere, there have been certain forms of IGRs directed at physical development. For example, in 2000, there was a bilateral conference on Co-operative Research and Management of Binational Resources in the Upper San Pedro River Basin of Sonora and Arizona of Mexico and the United States. The conference was to foster knowledge exchange and operation among residents, resource users, resource managers, and scientists in the upper San Pedro River Basin (McElroy, 2000). In giving the background of the context, McElroy stated that San Pedro River Basin begins 40km south of the United States – Mexico border in Sonora and flows north about 240km to the Gila River in Arizona. The surface – water catchments for the San Pedro River drains on an area of 11,620km², of which approximately 16% is located in Mexico. During the conference, several elected officials from nearby communities made brief comments about activities related to the San Pedro River, so that by sharing scientific research results with those at the local levels, the conference demonstrated how science can contribute to the formulation of rational resource management strategies.

There are two issues of interest in the binational conference as discussed above. One is that people of both sides of the Mexico and United States border had a common goal. The goal was how

best to reach an equitable means of preserving the unique habitat and the communities of the upper San Pedro River basin. These issues are germane to IGRs arrangements irrespective of the scope of such arrangements.

In Africa, there have been different attempts made at embracing intergovernmental relations for certain common goals. The latest move in this direction is the New Partnership for Africa's Development (NEPAD). NEPAD, according to Mashele (2007), is a holistic integrated sustainable development initiative for the economic and social revival of Africa involving a constructive partnership between the continent and the West. It was the belief of the African Heads of State that the attainment of the objectives of NEPAD, chief of which is to 'halt poverty in Africa by 2015', would facilitate the creation of an African Economic Community by 2025.

NEPAD has a framework that comprises three segments which include (Mashele, 2007):

- a. Establishing the necessary conditions for development: This includes ensuring that there is peace, security and good governance on the continent;
- b. Identification of key priority sectors: These include agriculture and food security, trade and market access, infrastructure development, human development including health and education, science and technology, culture, environment and tourism;
- c. Resource Mobilization: This includes mobilizing domestic investment as well as seeking external technical and material support.

After an overview of the implementation of NEPAD since the programme's inception, Mashele (2007) made two main observations. One is that NEPAD distinguishes itself from previous plans on the basis of its clearly elaborated leadership and implementation monitoring structures. The other one is the emphasis that NEPAD places on the need for African leaders to address issues of governance. These observations are central in the scheme of IGRs.

In Nigeria, there are forms of intergovernmental relations existent among the tiers of government. Nnamani (2003) stated that Nigeria operates a three tier system of government out of which certain systems of IGRs exist. The tiers include the federal government, the state government and the local government. The

totality of all vertical and horizontal complex of formal and informal interactions among all these levels or tiers of government constitute the IGR's (Nnamani, 2003). Adamolekun (1989) gave the dimensions of the relationship as federal-state-local, federal-local, inter-state, state-local and inter-local relations. The 1999 constitution of Nigeria spelt out the inter-relations expected among the levels of government existent in Nigeria. The exclusive legislative list and the concurrent legislative list in the second schedule to the constitution provide the broad framework for federal-state and local government relations, while the functions of the local government as spelt out in the fourth schedule indicate the major issues in state-local relations (Federal Republic of Nigeria, 1999).

The Study Area

Enugu State is one of the thirty six states into which the country, Nigeria, is currently divided. It came into existence out of the old Anambra State in 1996. The name Enugu is derived from Enugu city, the State Capital. It is made up of seventeen local government areas. It is represented by eleven elected members in the National Assembly, that is, three in the upper house (Senate) and eight in the lower house (House of Representatives). In the State House of Assembly, there are seventeen members representing the seventeen local government council areas of the state. There are three political zones in existence, namely, Enugu North, Enugu West, and Enugu East, and three corresponding urban centres, Nsukka, Orji-River and Enugu.

Furthermore, each local government council area is a political unit that is divided into council wards. There are a total of three hundred and sixty wards in the state during the Fourth Republic. Four tiers of government are in existence in the state, namely, International, Federal, State and Local. Several agencies of these governments are charged with physical planning development responsibilities in the State.

Methodology

Survey research method was adopted for the study. The study was carried out in 2009 and the sample frame included officials in town planning matters, relevant ministries and parastatals, the local government councils, communities and their leaders and other concerned international agencies. Proportionate stratified

random sampling was used in selecting the respondents from various populations of study.

Questionnaire was administered alongside interviews to gather data on the involvement of different tiers of government in the implementation of projects, number of projects implemented and the finance released for the projects during the period under study, projects abandonment and the preferred option for management of intergovernmental relations. Multiple regression analysis was the statistical tool adopted for the analysis of the data. Descriptive analysis was also adopted for a group of generated data.

Data Presentation and Analysis

The number of other agencies that were involved in the execution of projects by a particular agency during the period under review represented the scale of intergovernmental relations. The number of physical development projects executed during the period represented the scale of implementation of physical development projects. Average percentages of the amounts released for target projects during the period represented the scale of financial commitments. The observed frequencies in respect of the foregoing for the variable have been presented in Table 1.

Table 1: Observed Frequencies on IGRs, Physical Development Project and Financial Allocations

S/N	Agency	No of Other Agencies Involved in Executing (y)	No. of projects Executed (X ₁)	Amt Planned (Nm)	Amt Released (Nm)	Av. % Release (X ₂)
1.	United Nations Development programme	3	5	132.40	29.33	29.20
2.	Department for International Development	3	3	33.40	16.80	46.49
3.	Federal Ministry of Works	1	2	1013.31	39.13	6.06
4.	Federal Min. of Housing & Urban Dev.	1	1	313.77	4.42	1.27
5.	State Ministry of Works & Transport	2	6	2773.50	1752.36	73.90
6.	State Water Corporation	1	2	3274.97	1488.79	47.21
7.	State Rural Electrification Board	1	6	962.96	5575.41	479.78
8.	State Town Planning Department	1	2	1229.00	1586.82	128.43
9.	State Local Government Councils	2	19	18373.16	18373.16	100.00
TOTAL		15	46	28106.47	28866.22	101.37

Source: Federal Ministry of Finance 2006, Enugu State of Nigeria (2002, 2003, 2004), Author's Research (2009)

Taking other agencies involved as the independent variable (y), the projects executed and percentage amounts released as dependent variables, x_1 and x_2 respectively, regression analysis and analysis of variance (ANOVA) test was carried out. The result suggests that intergovernmental relations on the implementation of physical development projects do not facilitate achievement of objectives.

The statistical model used has a revealing output as given below ($R = 0.427$, $R^2 = 0.183$, Standard Error = 0.9041, F – Value = 0.671).

From the data above, R^2 (coefficient of determination), which shows the strength of relationship) has a very low value. This shows that there was virtually no relationship between the variables. Furthermore, F-probability, which is greater than the 0.05 confidence level, proves that there exists no significance in the combination. The hypothesis was, therefore, upheld.

Table 2: Opinion of Respondents in having a separate Body for the Management of Intergovernmental relations.

S/N	Respondent (Agency)	Total No.	Opinion			
			Yes	%	No	%
1.	Local Government Councils	17	17	100	0	0.00
2.	Planning Authority Chief/Executive	17	12	19.10	5	5.62
3.	Community Leaders	215	197	91.63	18	8.37
4.	Town Planners	20	9	10.11	11	12.36
5.	Other Related Professionals	17	9	10.11	8	8.99
TOTAL		286	244	85.32	42	14.68

Source: *Author's Research, 2009*

In a section of the questionnaire, the opinions of the respondents were sought as to whether separate bodies should be constituted to oversee interrelations in the execution of physical development projects. The opinions have been shown in Table 2.

Table 2 indicates that out of 286 respondents, 244 or 85.32% were of the opinion that separate bodies should be set up to oversee intergovernmental relations in the state. 42 or 14.68% were of the opinion that there is no need for such.

Discussion of Findings

The discussion on the findings of the study hinged on the result of the hypothesis formulated for the study and as well as the analysis of other groups of data. An attempt was made to bring the discussion to bear on the data presented and analysed. The result has two principal revelations. Firstly, intergovernmental relationship among the agencies that are charged with the responsibility of physical planning and development in Enugu State was not established. The second revelation is that there appeared no relationship between the interrelationships among the physical development agencies and the funds released for target projects in the state. The cumulative percentage release of 101.37% did not agree with physical manifestation of projects as observed during the study. To this end, intergovernmental relation, which was supposed to hinge on the effectiveness of fund releasing and utilization, can scarcely thrive where the utilization is as low as revealed by this study. Intergovernmental relations among the agencies, therefore, can be made more functional when funds released for target projects are put into more effective use by such agencies. By so doing, the advantages of good intergovernmental relations can be tapped. Such advantages, among others, include:

- (a) Concord of purpose among major stakeholders
- (b) Elimination of waste and duplication of labour and materials
- (c) Existence of co-operation rather than competition among physical planning and development agencies.
- (d) Sustainability of development programmes through succeeding governments

- (e) Improvement of employment opportunities through enlarged physical development programmes.
- (f) Raising the potential for tapping the economic base of the state.
- (g) Ensuring good utilization of the state political structure in initiating, funding and implementing target projects.
- (h) Arousing the interest of political office holders in the delivery of physical development programmes.
- (i) Ensuring a fair spread of physical developments in the state.

This can only be indicated by physical manifestation of such target projects.

However, the study on existing intergovernmental relations in the state was not absolutely decisive. For example, for the fact that the international agencies concerned with physical development in Enugu State have specified areas of operation, it was difficult to deduce specific areas of interdependence. But since there appeared not to have been clearly espoused deliberate attempts at institutionalizing coordinating bodies for intergovernmental relations at any level of governance in Nigeria, not much efforts were found to be in line with the quest of this study in Enugu State. It is believed that a deliberate attempt at creating good intergovernmental relations among the levels of government would bring about their concord of purpose. In this case, a positive and significant relationship would exist among them. This would, in turn, create a positive and significant relationship among them and effective utilization of funds released for physical development projects. In this case, an enabling environment would abound for maneuvering any one or two of these variables (intergovernmental relations, funds and physical development projects) for efficiency in executing planned actions.

Another crucial dimension of the findings is that the rate at

which projects are initiated and abandoned was also found to be high. For example, the Udi Local Government initiated a regional market at 9th Mile Corner of Enugu State, but this has long been abandoned. Furthermore, some office blocks in the development centres created by the State Government in 2004 are yet to be completed. At state level, such state roads as Ukehe-Aku-Nkpologu and Enugu-Mbu-Opi roads are yet to be completed after several years of commencement. That is a situation where a project that was initiated and commenced by any existing administration lacked continuity by any succeeding administration. This phenomenon was more prevalent among the local governments in the state. Furthermore, the low pace of implementation of physical development programmes at the local level negates the purpose of the third tier level of government. Ideally, the creation and recreation of local government areas were aimed at facilitating development to reach the people at the grassroots, make rural life more meaningful and, thus, reduce urban-rural gap. For the fact that, despite these local government creations, and the yearly state budget proposals to tackle physical development problems at all levels, some areas still exhibit lack of basic infrastructure, an interdependence of actions by stakeholders is desirable. In this case, a co-ordinating team would be mandated to keep tracks of major developments among planned programmes and respond accordingly for overall efficiency. If this is done, it will be in tune with Olumese's (1987) opinion that the existing administrative structure of our economy (i.e. the Nigerian Economy) should be modified to the maximum advantage to facilitate the integration of development planning for overall national development. The modification, according to him, should be along functional institutional arrangement or organizational structure, which emphasizes interrelationship among all government agencies.

However, for intergovernmental relations efforts to thrive, there should be some enabling opportunities. It is on such enabling opportunities and how best to utilize them that planning for good intergovernmental relations among the levels of government are based. Such opportunities for intergovernmental relations in Enugu State revolve around the presence of different governmental levels, the resources available, the existing senatorial zones and political structure. Some of the international agencies in Enugu State deal specifically with physical developments. Examples include the United Nations Development Programme (UNDP) and the Directorate for International Development (DFID). Federal agencies include such Federal Ministries as Works, Housing and Urban Development. The State Government also has ministries and parastatals charged with physical development programmes. Examples include the Ministry of Works and Housing, and the Ministry of Public Utilities.

The resources include human resources in form of labour availability; natural resources in form of forest resources, solid minerals and tourist attractive areas; and man-made resources in form of physical infrastructure. Furthermore, the existing senatorial zones form a strong base for a functional regional arrangement since the political structure (local, state and national legislators and other officials) has already taken that shape. Any efforts, therefore, put towards 'emplacing' any intergovernmental structure would thrive with minimal difficulty.

Conclusion

In this study, the level of and opportunities for intergovernmental approach to physical planning and development in Enugu State have been highlighted. The net finding is that, since there has not been any deliberate arrangement for

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Conclusion

In this study, the level of and opportunities for intergovernmental approach to physical planning and development in Enugu State have been highlighted. The net finding is that, since there has not been any deliberate arrangement for

intergovernmental relations among concerned agencies, the level of physical development has remained insignificant. That is, there is less vigour in interdependence among agencies involved in initiating, funding and implementing development programmes.

The study revealed that what would stand any intergovernmental arrangement in good stead in the state, especially in relation to the fiscal aspect, would be the representative structure at the federal, state and local levels. It is a structure whose potentials are virtually untapped. If the officials of the structure will be galvanized in accordance with the roles expected of those in service delivery and other stakeholders are brought together, the goal of this study will be achieved as time goes on. As also gathered in the course of the study, communities are willing to work together, local governments, ministries, parastatals, international and federal agencies in the state are all willing to work together to enhance efficiency. Local governments, ministries, parastatals, international and federal agencies in the state are also willing to work in partnership with others in executing physical development programmes.

The regional arrangement in Enugu State has the potentialities for direct allocation of resources to achieve desired regional, state and national objectives. This is so since such arrangement is a handiwork of the state government, in which case the regions can be said to be essentially concerned with defining areas for intermediate level of government and administration.

All these issues raised have been carefully addressed by the recommendations of this study. As a major contribution, therefore, this study stands out as both a descriptive and prescriptive document for intergovernmental approach to physical planning and development.

Recommendations

Having assessed the level of intergovernmental relations and the opportunities thereof in physical planning and development in Enugu State, on one hand, and the need to constitute separate bodies to oversee the relations on the other hand, the following recommendations are made for efficiency.

a. Intergovernmental co-operation should be constituted at the state, regional and local levels. At the state level, a coordinating team to be called the Enugu State Council on Intergovernmental Relations (ESCIR) will be set up. The heads of the various federal and state ministries and parastatals, as well as other international agencies, involved in physical development should be representatives at ESCIR in spite of the delay that may occur. At the regional level, Regional Council on Intergovernmental Relations (RCIR) will be set up. The local government council chairmen, the Town Planning Officers in charge of the Planning Authorities, Federal and State Legislators, appointed officials and other physical development personnels in each region will be representative at RCIR. At the local government level, Intergovernmental Relations Committee (IRC) will be set up. The heads of departments concerned with physical development as well as community leaders should be representatives at IRC. Other non-governmental stakeholders should be involved, as due, at each of the three levels discussed. The IRC will harmonize Rural Area Plans (RAP) and Local Plans (LP) as they affect the respective local government areas and in conformity with RCIR directives. The RCIR will harmonize sub-regional plans (SRP) based on collated RAPs and LPs in each region and in conformity with ESCIR directives. ESCIR will harmonize the various objectives of the different ministries, parastatals, agencies and come up with an integrated physical development plan. Intergovernmental relations at Enugu State will better take the form of Regional Plans (RP), Urban Plans (UP) and subject Plans (SP). Because such an arrangement will ensure

project initiation at the grass-roots level.

b. The Enugu State Council on Intergovernmental Relations (ESCIR) should be made to ensure the preparation of and judicious implementation of integrated physical development plans by making sure that the stakeholders co-operate in contributing resources (money, men and materials).

c. The existing three political zones of Enugu North, Enugu West and Enugu East should be adopted as three regions of physical development planning and using each of the three respective urban centres of Nsukka, Oji-River and Enugu as regional centres. The RCIR in each region should keep track of the resources available to ensure optimum utilization and possible measures for growth.

d. Funding physical development programmes should be a collective responsibility of the three levels of government (Federal, State and Local) in the state. With the arrangements in (a) above, the interest of international agencies and other stakeholders will be aroused, in so far as there is apparent transparency in the scheme of operation. In this case, therefore, the coordinating team (ESCIR) should be made to ensure prompt and adequate funding from concerned stakeholders.

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