

**EFFECT OF URBANISATION ON
SUSTAINABLE DEVELOPMENT
IN SOUTH-WEST NIGERIA.**

By

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CERTIFICATION

This is to certify that the Thesis:

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DEDICATION

To the Glory of Almighty ALLAH.....

ABSTRACT

This study considers the effect of urbanisation on key economic, social and environmental variables. These variables are used to develop indices to measure sustainable development in the urban areas of South-West Nigeria. It is done by assessing the impact of urbanisation and some other driving force of development on urban economic growth and the quality of life and quality of the environment in the area.

A thorough review of issues and concerns relating to urbanisation economic growth, economic development and sustainable development is made. The review of literature highlights the unique features of urbanisation in South-West Nigeria as well as the drivers of sustainable development. These are incorporated in the formulation of the models and testing of the hypotheses intended in the study. It also permits the construction of indices of sustainable development and urban blight for the area.

The models employed are based on the overall hypothesis that constraints on sustainable development in the urban areas of the region arise from low investment in socioeconomic infrastructure, high population density and poor quality of human capital.

A two-way causation is postulated between the variables of urbanisation and sustainable development which results in treating the function as a system of simultaneous equation to emphasise the joint dependency of the two variables.

The Koyck's geometric lag scheme is employed to transform the distributed lag variable in the model and the two-stage least square (2SLS) econometric technique is employed to obtain the estimates of the structural parameters.

Four states of South-West Nigeria are selected namely Lagos, Ogun, Oyo and Ondo. The selection is based on their length of existence. Important socioeconomic, demographic and

environmental data are obtained and used in determining the key parameters required to test the hypotheses and realise the objectives that are set out in the study.

It is found that in the urban areas of South-West Nigeria, the momentum of urbanisation is accentuated by the previous level of growth of urban areas of the region, but not by level of investment in urban socio-economic infrastructure. Similarly, level of urban income and sustainable development are driven by their previous level while educational expansion in the urban areas of the region is found to deteriorate the level of sustainable development in the area. It is also discovered that while the urban areas of Lagos State are faced with the possible threat of over-urbanisation, urban areas of Ogun and Oyo States can marginally accommodate increased urban growth that can contribute to increased level of sustainable development.

In view of these, policy recommendations are made to turn around the fortunes of the urban areas of the region with respect to infrastructure, qualitative education, urban unemployment, urban renewal and poverty reduction in order to redirect them to the path of sustainable development.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The South-West region of Nigeria is remarkable in pattern of development, population distribution and human settlements. Available statistics shows that the pattern of human settlements is predominantly rural in nature with about 37 percent of the population living in settlements of more than 20,000 inhabitants (Nigerian National Census, 2005).

However the rate of urbanisation is high, attained through rapid rate of growth of urban population. While the average population growth rate was 2.9 percent between 1992 and 2004, urban population growth rate was 5.5 percent during the same period (Okunola 2006).

Indeed, the system of urbanisation in South-West Nigeria dates back to the 10th century when an indigenous colonialist movement which centred around Ile-Ife in the present Osun State of Nigeria, resulted in the creation of cities at Oyo, Ilorin, Sabe, Ketu, Ondo, Ijebu-Ode and Benin (Mabogunje 1981).

By the 19th century, new urban centres had emerged in Ibadan, Abeokuta and Shagamu with a development system that emphasises the exchange of goods and services and socio-cultural and political integration with their local hinterland.

This urbanisation system was enhanced by the British colonial administration through policies that enhanced the pattern of urban population growth of the region. The colonial administration needed the

centres to execute its political and economic agenda. As a result, it provided enabling socioeconomic environment for the centres to grow rapidly and thrive while conscious policy and efforts were made to stimulate the emergence of new towns and cities (Mabogunje 1981).

The first policy to stimulate the growth of cities was the policy of indirect rule of 1900 which prescribed that urban settlement be administered by the native rulers while restraining the colonial administration from any land control in the traditional cities (Onokerhoraye, 1992). In view of this policy, the cities began to burgeon considerably, reducing many of its areas into slums and environmental eyesores.

The Nigerian Township Ordinance of 1917 established the broad principles of urban responsibilities to stem the problem of environmental degradation inherent in the non-controlled land use policy of the indirect rule. The ordinance laid down guidelines for urban management and physical layout of towns and guided the distribution of government amenities.

The Nigeria Town and Country Planning Ordinance no 4 of 1946 provided the legal basis for setting up urban planning authorities and schemes in South-West Nigeria, even though the practice of urban and regional planning did not materialise until years later.

Similarly, the British embarked on the construction of the railway in 1900 for easy exploitation of resources. In the process, a number of traditional and important urban centres were by-passed in the South-West leading to a change in their demographic composition as a result of out-migration of people. These cities included Ile-Ife, Ilesha, Ijebu-Ode, Ondo and Akure. The railway cities on the other hand, did not only grow in population but showed a strong tendency for male dominance (Nigerian National Census, 1952)

The railway stimulated trade over a large part of the region and became a strong factor in its urbanisation process through the transformation of the centre's administrative roles and the development of the industrial and service sectors of their economies (Mabogunje, 1981).

At independence in 1960, the South- West of Nigeria emerged as the most urbanised part of Nigeria with an urban population of 2,354,700 people and 16 settlements of over 20,000 inhabitants (Nigerian National Census, 1963). It also emerged as an integrated urban system pivoted on its primate cities, Ibadan and Lagos.

However in the process of political engineering, dictated by the outbreak of the civil war, Nigeria adopted the political strategy of states creation resulting in the enhancement of the political and socioeconomic status of some secondary cities in the region.

These secondary cities became strong economic and production centres and seats of power, which gave it easy access to public investment, and competitive power to attract federal government grants for socioeconomic development.

The civil war also led to the displacement of thousands of people, many of whom were rural dwellers, some of them ended up settling down in the urban areas of the region.

The massive injection of funds to develop urban utilities and infrastructure in the wake of the post-civil war oil boom also accelerated the process of urbanisation by massive rural-urban migration. According to Esang and Mabawonku (1974), the urban areas of the region sapped all the human resources developed in the rural areas during this period. This assertion was also corroborated by the 1991 population census, which showed

palpable increase in the proportion of the region's urban population from 15% in 1963 to 38% in 1991.

Thus, the urban areas provided the escape route from the subsistence livelihood of the rural areas to relative affluence of the urban areas and from entrenched and perpetual disguised unemployment to the possibility of real employment in the urban areas.

From the foregoing, it can be deduced that the pattern of urbanisation in the region has ensured that the urban areas performed political, intellectual, and economic functions. They are centres in which new forms of economic organisation do evolve. They are centres of industrialisation, economies of scale and agglomeration where new markets and sources of supply are explored and conquered.

They provide answers to the needs and aspirations of many people. They provide economic hope for millions of jobless rural migrants and the entire Nigerian growing population.

But while this nature of urbanisation could be desirable to a large extent, it poses additional demands on the capacities of the urban centres to provide land, shelter, infrastructure, services and employment. It also leads to special environmental problems such as congestion, pollution, flooding and others, all of which can be summarised in the statement of the UNDP (1996) Human Development Report that "rapid urbanisation is neither a crisis nor a tragedy. It is a challenge for the future. The focus on today's cities must move decidedly towards better management, with past failures giving way to more appropriate policies and practices."

1.2 The problem

The urban centres of South-West Nigeria are essentially the points of articulation of regional and national economic system and they provide the momentum for the region's development because of its economic agglomeration. The result is that people and activities converge to seek the benefit of proximity. In the process, they often reap unwanted negative external effects, due to economic, social and spatial inefficiencies and environmental degradation arising from waste generation, pollution, urban blight and urban runoff.

One of the biggest environmental problems associated with urbanisation in South-West Nigeria is solid waste generation, which must be managed in a way that is not detrimental to the urban population or the environment. Unfortunately, the problem of solid waste management in the urban centres of the region has become one of the most intractable environmental problems facing urban managers in the region. There has been tremendous increase in the volume and range of solid wastes generated daily in the region's urban centres (See appendix 1)

Furthermore, limited solid waste disposal capacity has also contributed to urban environmental degradation through the unsanitary conditions in which solid waste is collected, processed and disposed.

Pollution is the addition of substances, which constitute danger to human health and the environment in view of the substances' properties or quantity. In South-West Nigeria, rapid urban growth, increasing development and social change have brought various forms of pollution (George 2000b). The air, water and land, within and around the urban areas do absorb, dilute and carry away the wastes generated from human economic activities resulting in air and water pollution.

Air pollution in the urban centres of South-West Nigeria comes mainly from motor vehicles and combustion of fossil fuel in industries. Motor vehicles emit predominantly sub-micron aerosol, which are later deposited on urban vegetables and fruits. Industries predominantly release wastes into the cloud which drop back with rainwater in form of sulphuric and nitric acids (Pearce and Turner, 1990).

Besides, air pollution is caused in the urban centres of South-West Nigeria by domestic and industrial solid wastes that are not treated and the stench is allowed to escape.

Pollution in urban South-West Nigeria is clearly visible and poses clear and immediate health risks to many people. Perhaps, one of the most serious health risks attributable to pollution arises from direct exposure to suspended particulate matters (SPM).

Its health consequences include high incidence of respiratory diseases such as cough, asthma and bronchitis as well as increased mortality rates among children and the elderly.

SPM can also carry heavy, poisonous and carcinogenic metals into the deepest and most sensitive parts of the lungs (UNDP, 1996). Sources of SPM include smoke from incomplete fuel combustion and pollutants such as sulphur-dioxide and water.

Besides, there is a general assertion that the pattern of location of some industries in industrial estates of urban South-West Nigeria that are relatively far from human dwellings may tend to reduce the environmental hazards arising from the gaseous discharge and effluents of these industries. But according to Grossman (1994), some of the potentially most hazardous gases like sulphur do not usually have concentrated adverse

impact in areas where they are discharged. These gases could travel long distances through the atmosphere and contribute to acidification of the environment in localities far from its origin.

In this respect, even where industrial estates are located away from the city centres, there is the likelihood that its gaseous discharge can still pose tremendous hazards to people and constitute environmental degradation to the centres.

Unfortunately, such health risks do not become obvious immediately, as the effect of waste of industrial gaseous discharge may not be felt for several years.

In addition to these environmental hazards are thousands of standby generators and bush burning activities within and around the urban areas of the region. Inadequate urban water supply makes water pollution one of the most potent dangers to human health and Sustainable development in South-West Nigeria.

One of the major sources of water pollution in the region is the discharge of pollutant effluents into rivers by industries. For instance in Ibadan, the industries in and around the city discharge their effluents into water bodies with little treatment (Sada, 1983).

Another major source of water pollution in urban areas of South-West Nigeria is the discharge of domestic sewage and refuse into river streams and drainage, from some of which people drink because of lack of portable water.

One important source of pollution in urban South-West Nigeria is urban runoff. It is closely related to the rapid rate of urbanisation in the region

as well as inadequate drainage system. It has resulted in major disasters involving disruption of socioeconomic activities, loss of life and property and displacement of people.

As regards urban floods, these are overland body of water, which are sufficient to cause significant property damage, traffic obstructions, nuisance and health hazards (Odemerho, 1988). Flood in South-West Nigeria is closely related to rapid rate of urbanisation and inadequate urban runoff disposal system. It has resulted in major disasters involving disruption of socio-economic activities, loss of life and property and displacement of people. For example, three people died why over two thousand people were displaced in Ajah and Ibeju-lekki local government area of Lagos State on July 7th 2007 as a result of flood (The Punch Newspaper 2007). In fact the worst incidence of flood was recorded in Ibadan from the night of August 30th through the morning of August 31st 1980. The flood claimed 300 lives, displaced an estimated 50,000 people and destroyed property worth three hundred million Naira (Daily times Newspaper 1980)

There is no doubt that the incidence of flood is not only frequent but it is also severe and devastating. But the frequency does not stem from increased rainfall but a response to an increasing rate of urbanisation in the absence of a well articulated and comprehensive urban planning and land-use control (Onokerhōraye, 1992).

Related to flood is soil erosion, which is the detachment and transportation of soil particles by runoff water in the region (Odermerho, 1988). A large number of South-West cities are increasingly experiencing soil erosion. This has posed serious threats to property development and natural recreation in the region.

Concerning deforestation and loss of biodiversity, a large number of South-West urban areas have developed on sites that are prone to hazards because its development has led to extensive modification of the natural sites and indiscriminate felling of trees. In fact, urbanisation has been one of the major factors that have contributed to the deforestation of various parts of the region.

Another important factor of environmental quality is urban blight, which refers to the poor physical condition in urban structures and facilities. It usually results in filth and unattractive environment. It is most observable in the traditional suburbs of all South-West Nigeria's urban centres where it is manifested in crowded accommodations, congested streets and buses, squatter settlements, breakdown in waste management, water and electricity shortages.

Similarly, urban blight has considerable effect on the pattern of land-use in the urban centres of the region. It is the major cause of environmental degradation because land is used intensively and without consideration for allocation of spaces for other essential activities such as transportation, recreation and commercial facilities.

Furthermore, urban blight problem in the urban centres of South-West Nigeria arises from the defective allocation of urban land among various land-use activities. In view of this, the proportion of urban land-use allocation that can ensure a tolerable environment is not being adhered to in the region. According to Agbola (1998), over sixty percent of the developed land in Ibadan was allocated to residential use while only 14 percent and 0.3 percent was allocated for transportation and recreation respectively. Similarly studies of land use allocation in other South-West cities indicated identical pattern of land allocation (Mabogunje 1981).

One of the most important constraints to urban environmental quality in the region is lack of adequate space for recreational activities in the urban centres as mentioned earlier. Closely related to this is the lack of recreational facilities for urban dwellers. The lack of open spaces for recreational activities is one of the major constraints to leisure pursuits in the region. From the comparative study of Falade (1985) on the outdoor leisure pursuits of residents of Ile-Ife and Jos, it was found that residents of Jos, participate more in outdoor leisure pursuit than Ile-Ife residents and that the availability of open spaces accounted for as much as 50 percent of the hindrance on full outdoor leisure participation.

Thus, urban environment in South-West Nigeria is a reflection of the economic activities of its inhabitants. In other words, the vast majority of the components of urban environment in the region are determined by human activities and efforts. Similarly, aspects of urban physical environment such as the distribution of residential areas for various degrees of population density and for commercial and industrial buildings are also reflections of human activities.

This suggests that the daily life of every urban inhabitant in the region is influenced by the quality of life and the quality of the urban environment.

Secondly, the general effect of the deterioration of the quality of urban environment in the region with, urban runoff, flood, erosion, pollution, ineffective waste disposal and urban blight imposes severe losses on the economic well-being and satisfaction of the inhabitants.

This shows that the large extent of environmental deterioration and economic losses resulting there-of, are partly a result of policy failure and lack of appropriate indices to capture the interaction of the environment and development.

These invariably lead to the following research questions.

1.3 Research Questions

- i) How does urbanisation affect the quality of the environment in the urban areas of South-West Nigeria?
- ii) How do the major driving forces of development affect sustainable development in the urban areas of the region?
- iii) How does investment in socioeconomic infrastructure contribute to urban and economic growth in the region?
- iv) What is the effect of industrial growth on urban blight in the urban areas of the region?
- v) What is the effect of growing population density on sustainable development in the region?

1.4 Objectives of the Study

The broad objective of this study is to determine the effect of urbanisation on sustainable development in South-West Nigeria.

The specific objectives are:

- i) To determine the contribution of socioeconomic infrastructure to urban and economic growth in the region.
- ii) To examine the effect of industrial growth on urban blight in the study areas.
- iii) To estimate the effect of the growing urban population density of the region on sustainable development in the region.

1.5 Hypotheses to Be Tested

The null hypotheses are:

- i) That sustainable development in the study area is not significantly affected by the level of urbanisation.
- ii) That poor quality of life of the people is not a significant constraint to sustainable development in the study area.
- iii) That investment in socio-economic infrastructure does not contribute significantly to urban growth in the study area.

- iv) That economic growth in the study area is not significantly affected by investment in socio-economic infrastructure.
- v) That industrial growth has no significant effect on the growth of urban blight in the study area.
- vi) That growing population density of the study area does not significantly affect sustainable development.

The alternative hypotheses are:

- i) That sustainable development in the study area is significantly affected by level of urbanisation.
- ii) That poor quality of life of the people is a significant constraint to sustainable development in the study area.
- iii) That investment in socio-economic infrastructure contributes significantly to urban growth in the study area.
- iv) That economic growth in the study area is significantly affected by investment in socio-economic infrastructure.
- v) That industrial growth in the study area has a significant effect on the growth of urban blight.
- vi) That growing population density of the study area significantly affects sustainable development.

1.6 Justification and Relevance of the Study

This study is expected to provide a new dimension and direction to urban economic policy formulation which will provide the basis not only for a faster and sustained growth but also a rapid and sustainable development of the urban areas of South-West Nigeria in particular and the whole of urban Nigeria in general.

Urbanisation in the region has generated important demand shifts largely towards commodities with high import content inspite of national foreign exchange crisis.

Similarly, the economic policy of the government has been widely criticised for rapidly eroding the quality of life of the people (Onimode, 1995; Adejugbe, 1995). Our study is expected to provide the impetus for desired economic development.

The South-West governments spend unsustainable large portion of their budget on urban social services which are not egalitarian, inefficient and ineffective (Onokerhoraye, 1995). This study is expected to expose the efficiency or otherwise of infrastructural investment in the urban areas of the region.

The concentration of vast majority of people in urban centres of South-West Nigeria does have major implications for the maintenance of a tolerant urban environment and the consumption of natural resources to sustain them. But government effort at preserving the environment has been very limited. Our study is expected to expose the relationship between environmental concerns and economic development in the urban areas of the region. It will expose the environmental problem of these urban areas in view of the neglect of the environmental considerations in planning efforts over the years. At the same time, it will expose the need for recognition of environmental management and improved quality of life as the bedrock for the sustenance of the process of economic development today and in the future.

Finally, there is no doubt that the quality of the home, work, neighbourhood and urban environment and the extent to which the inhabitants are protected from biological pathogens and chemical pollutants in water, air, soil, food and other environmental hazards have major influences on the well-being of the people. This study will provide the basis for the improvement of urban centres in South-West Nigeria from their present often destructive processes of development to sustainable development

1.7 Scope And Method of Research

This study covers the urban areas of the South-Western region and Lagos, which later metamorphosed into South-West region of Nigeria in the process of political engineering in the 1990s. The States that comprise the South-West region are Lagos, Ogun, Oyo, Osun, Ondo and Ekiti States.

The time period for empirically estimating and testing the models ranged from 1977 to 2004 with data from various statistical publications such as the Federal Office of statistics (FOS), South-West of Nigeria States' Ministries of Finance, National Planning Commission and the Central Bank of Nigeria.

Our hypotheses on the effect of urbanisation on Sustainable development in South-West Nigeria are based on simultaneous equation models. It is hinged on the overall hypothesis that constraints on Sustainable development in urban South-West Nigeria arise from dwindling investment in socioeconomic infrastructure, growing blight of the area and poor socioeconomic condition of the people.

This approach marks one of the unique features of our research as it allows for simultaneous economic analysis, policy formulation and evaluation. Thus, the first step in our methodology is the formulation of models that express the relationship between urbanisation and sustainable development. This is transformed using koyck's geometric lag scheme after which the simultaneous equation models are derived.

To ensure estimatability, we identify the simultaneous equation model in terms of the order (necessary) and rank (sufficient) conditions. The simultaneous equations of the model are all over-identified.

The two-stage least square (2SLS) econometric technique is applied to obtain estimates of the structural parameters by means of computer software for econometrics, the Econometrics View (E-View) packages.

1.8 Plan of The Study

This study contains six chapters as follows:

Chapter one is the introductory chapter. It contains the problem and need for the study, objectives and relevance of the study, definitions of concepts, and scope.

Chapter two is the review of related literature and theoretical framework.

Chapter three is the methodology

Chapter contains the model building, analysis and discussion.

While chapter five contains the policy implications of the study and conclusion.

1.9 Definition of Concepts

1.9.1 Urbanisation

This is the pattern of spatial distribution of population that emphasises the concentration of population in towns and cities. An urban area in Nigeria is classified as any settlement with 20,000 or more inhabitants (Nigerian National census 1991) resulting in changes in landscapes, environmental and ecological conditions and often-times with little corresponding infrastructure.

1.9.2 Sustainable development

Sustainable development is the balancing of economic development and environmental protection goals such that society is able to pursue developmental goals through control of harmful impact of human activities on the environment.

1.9.3 Urban blight

Refers to the poor physical conditions of urban structures and facilities that are manifested in poor living conditions of the people.

1.9.4 Investment in Socioeconomic Infrastructure

It is the amount of capital embodied in roads, and other forms of transportation, water supplies, electricity, and public services such as health and education.

1.9.5 Industrial Growth

It is the contribution of the manufacturing sector to total production.

1.9.6 Literacy Rate

The proportions of the adult population aged 15 years and over that are able to read and write.

1.9.7 Urban Income

It is the value of per-capita contribution to economic output of urban dwellers.

1.9.8 Unemployment Level

This is the proportion of unemployed people relative to the labour force.

1.9.9 Child Malnutrition

This is number of children under age five with no access to adequate nutrition.

1.9.10 Urban Runoff

This is overland flow of body of water, which is sufficient to cause significant property damage, traffic obstructions, nuisance and health hazards, flood and erosion.

CHAPTER TWO

LITERATURE REVIEW

The basis for the review of literature on issues concerning urbanisation and Sustainable development is to synthesize the salient features already established in the literature and to consider any critical issues that were not properly addressed with a view to providing a chart of the research done in these areas. It is also to consider all critical issues that were not properly addressed with a view to establishing how our current research fits into the timeline.

In this regard, our review of literature encompasses the various aspects of urbanisation, economic growth, economic development, environment and Sustainable development.

We begin with the review of issues relating to the analysis of urbanisation and economic growth. This includes examination of the momentum of urbanisation and the various models of urban and economic growth, their implications for development and their established shortcomings.

The growth analysis led to the consideration of literature on the environment and sustainable development. These are relevant for developing the models and testing the hypotheses outlined for this study.

We conclude by providing a summary and synthesis of the critical issues from which we derived a linkage of the various issues raised in the literature. This forms the basis for formulating our models and testing the hypotheses outlined for the study.

2.1 Issues Associated with the Momentum of Urbanisation

In this study, we define urbanisation in Nigeria as the pattern of spatial distribution of population in which people are concentrated in towns and cities giving rise to changes in landscapes, reduction in environmental quality and disturbance of the ecology. Urbanisation is therefore, regarded as a demographic and economic process of transforming natural environmental system into built-in environment of human settlements.

Indeed, literature is full of studies that confirm that rapid growth of urban areas in Less Developed Countries is rampant. (Singer, 1979; Becker, 1992). One major conclusion from many of them is that there is no shortage of policy that can create urban bias effect. This is because government has strongly favoured city growth over the past decades. (Markusen and Gwiasada, 1994; Ahmad, 1989; Bale and Lutz, 1981; Knight and Gappert, 1984; Abu-Lughod and Hay, 1979; Preston, 1988).

Urban bias effect of government policy is aggravated if domestic terms of trade are twisted against agriculture, when tariffs and exchange rate management protect urban industries instead of agriculture. Money and capital market may favour urban investment and social overhead may be allocated to favour the cities. Furthermore, technology is more rapidly introduced in the urban sector and since urban industrial output is relatively price elastic, factor growth tends to generate elastic supply response rather than price decline.

Thus, since technological dynamism makes the urban sector to have relatively higher rates of total factor productivity growth and the demand for urban products is relatively price elastic, then the derived demand for urban job is augmented. While urban jobs are in the process created,

rural-urban migration is stimulated and the cities expand astronomically. In this respect, the higher the price elasticity of demand for urban products, the greater the tendency for increasing urbanisation. Similar experience has also been recorded in urban Nigeria (Okojie, 1995).

Another important issue raised in the discussion of the momentum of urbanisation is the identification of the city as the provider of the means and the markets in Nigeria (Onibokun, 1987).

In this respect, the growth of the cities provides more markets and more labour and more enterprises are drawn to profit from them. Urban proximity cheapens services and costs resulting in pressure on the government to provide utilities, which in turn attract further migrants with money to invest and/or labour to sell. This concept is adapted in this study to identify the drivers of urbanisation in South-West Nigeria.

Indeed Onibokun (1987), goes further to assert that the growth of Nigerian urban metropolises is the natural consequence of long term historical trends that are accentuated by the import substitution strategy of government, the relative stagnation of agriculture, the growth in the size of government and capitals and the implicit spatial impact of macro and sectorial policy of government.

Similarly, evidence from the study of Adepaju (1975), shows that the rate of increase in population is very high both in rural and urban Nigeria. However, the rural areas are not economically robust – the majority of whom are subsistence farmers with low and unimpressive financial returns. Moreover, rural poverty and rural lifelessness are further emphasised by the neglect of rural areas with respect to provision of social infrastructure and amenities and better economic opportunities.

As a result of the said neglect, the rural areas are unimpressive for the educated youth, leading to the desire for mobility and adventure. Todaro (2000) also corroborates this evidence in a study of migration pattern in some Less Developed Countries including Nigeria. He provides direct correlation between mobility and educational status.

Adepoju (1975) also avers that the natural rate of growth of the cities is very high while the economic opportunities are considerably limited because the Nigerian urban economy is predominantly basic. In other words, its pace of industrialisation is very slow, generative economic activities are very limited, and investment outlook is restrictive, while the majority of Nigerian urban inhabitants are living at subsistence level. For these reasons, the absorptive capacity of Nigerian cities in form of employment, housing, health facilities and social infrastructure are very limited. The consequences of these are universal poverty, housing shortages, urban slums, environmental squalor and a host of other socioeconomic problems.

Similarly, a rigorous exposition of the consequences of urbanisation undertaken by Okojie (1995), shows that one important issue that is germane to the momentum of urbanisation in Nigeria is the growing failure of Nigerian urban centres to fulfil much of the expectation of its inhabitants. This arises from very high rate of unemployment, lack of viable economic base and increasing environmental deterioration. As a confirmation of the exposition, he shows that the consequences of urbanisation is not just that rural-urban migration compounds the economic, social and environmental problems existing in the Nigerian cities, it also drains rural Nigeria of productive human resources leading to the deterioration of living conditions in the rural areas.

In spite of these consequences, the momentum of urbanisation in Nigeria has continued to rise essentially as a result of the urban bias policy of government. Sada (1996,) identified the reasons of urban bias in the public sector allocation of resources as being the unbalance in the distribution of economic power between rural and urban areas, second the urban-centred nature of institutional set-up for decision making on resource allocation and the proximity of urban poverty to the citadels of urban wealth and lastly is the perception of Nigerian cities as growth poles by policy makers.

One important issue raised by Adepaju (1975), is that the interaction of forces of rural-urban migration and the momentum of fertility in the urban areas engender the process of urbanisation in Nigeria. By so doing, an understanding of the relationship between migration and economic opportunities in the urban areas is central to the understanding of the momentum of urbanisation, that the factors influencing the decision to migrate are varied and complex. However, it is certain that it arises as a selective process influenced by demographic, physical, social, cultural and economic factors.

Usually, rural-urban migration is considered as the migration of able-bodied people from the rural areas to the urban areas. By so doing, urban migrants tend to be young usually between the ages of 15 and 45.

According to Todaro (2000), most studies in Less Developed Countries including Nigeria have provided conclusive quantitative evidence of concentration of urban migration among young men. Although in recent years, the proportion of women migrating to urban areas has increased considerably.

Finally, one of the most consistent findings in the studies of rural-urban migration is the direct correlation between mobility and educational status.

Obviously, in Nigeria, there is a strong association between the level of education attained and the propensity of the people for rural-urban migration (Echebiri, 1997).

In other words, there is a strong relationship between educational attainment and labour supply especially in the face of declining urban employment opportunities. Given the growing decline of job opportunities in urban areas, the implications for Nigeria are daunting. First is that migration exacerbates rural-urban structural imbalance in several ways, by disproportionately increasing the growth rate of urban job seekers relative to the growth rate of urban population. Unfortunately, job mobility is more rampant among young and educated people in the rural areas. This tends to increase urban labour supply while depleting the rural areas of valuable human resources required for critical development.

Secondly, urban job creation mechanism is generally more difficult and costly to achieve than the rural areas because of the need for substantial complimentary infrastructure required in the industrial sector. In this respect, increased migration and job mobility tend to aggravate the daunting problem of job creation in urban areas.

Thirdly, the pressure of rising wages coupled with the growing use of labour saving technology in the urban areas do ensure that labour demand continues to lag behind supply. This tends to convert a short run problem of resource imbalance to a long run problem of rising surplus labour in the urban areas.

One major conclusion from the consequences of growing momentum of urbanisation in Nigeria is its exacerbation of the precarious socio-economic situation in the urban areas. Increasing urbanisation directly increases the growth rate of urban unemployment.

2.1.1 Models of Urbanisation

The complexity and diversity of urbanisation and its accompanying social, cultural and economic influences and forces makes it imperative to identify why urban areas grow through various urbanisation models.

The behaviour of the momentum of urban growth in Less Developed Countries is the basis of the model of Hay (1977). Based on the assumption that urban centres are located on a uniform plain, centralised services would be distributed regularly within a systematic pattern and this pattern of urbanisation would avoid overlapping services to the urban hinterland.

His model was based on the hypothesis that distribution of urban services account for the spacing, size and functional pattern of urban centres.

He concluded that this pattern of urbanisation reduces services overlapping and creates evolving hierarchy of urban centres, which would be modified by long distance trade and administrative functions.

Hay conclusion was severely criticised by Friedman and Wolff (1982), for being dependent upon the evolution of towns on uniform plains and for ignoring the influence of small and medium scale manufacturing and the informal sector in urbanisation.

Another important discourse on the behavioural pattern of the momentum of urbanisation is made by Clark (1996). It is hinged on the consideration of demand for urban products outside the boundary of urban settlement.

It infers that the growth of urban areas depends upon the ratio of basic and non-basic activities (distribution of goods and services within the urban areas). Basic activities being food distribution, transportation and housing

while the non-basic activities are found in the service sector. The higher the ratio, the greater the rate of growth because non-basic activities would depend on the basic sector with employees in this sector providing much of the demand for the products of non-basic activities. He also suggests that if an urban area loses some basic employment, less non-basic employment would be required and the town's population would decline at a multiple of the initial withdrawal of basic employment.

However, the validity of the conclusion has been severely criticised especially on the notion of constant basic and non-basic activities ratio and by the fact that the study gives prominence to basic employment while in fact non-basic employment may be much more important (Sutton, 1998).

A rigorous exposition of the behavioural pattern of the momentum of urbanisation is made by Guradet (1990). He employed the input-output analysis technique to construct a matrix of production and distribution of industries in the urban areas, as well as the nature of the interrelationship among industries and other economic sectors within and outside the urban areas.

His conclusion is that this technique enhances the understanding of urban growth and allows chain of repercussions stemming from a change in an industry or economic activity to be traced through, until adjustment necessary to restore stability has been made.

In an equally powerful discourse on the behavioural pattern of the momentum of urbanisation, Fundley (1993), developed the location model approach to growth by separating urban industries into three categories namely geographical oriented, complimentary and urban oriented industries. The first are mobile and are influenced by factors of market and source of materials. Complimentary industry requires the presence of other

industries while urban oriented industry evolves purely to satisfy the demand of the city.

The Lewis model of unlimited supplies of labour based its exposition on the pattern of momentum of urbanisation and on the assumption of surplus labour being available in the rural sector of the economy (Jhingan, 1998). It postulates that economic development takes place when capital accumulates as a result of withdrawal of surplus labour from the subsistence sector to the sector with reproducible capital.

The model is based on the assertion that there is perfect supply of labour in most Less Developed Countries. In other words, such economies are over-populated with respect to capital and natural resources so that the marginal productivity of labour is negligible, zero or even negative. By so doing, new industries can be established or existing industries expanded to accommodate the surplus labour and improve labour productivity.

One important characteristic of the Lewis model is the pattern of capital accumulation as a result of withdrawal of labour from the subsistence sector. Lewis asserts that since capitalists produce to accumulate profit and since the marginal productivity of labour in the sector would be higher than the wage rate, the result would be high capital accumulation. This can be reinvested leading to higher capital formation and continuous employment from the subsistence sector. This process continues until the capital-labour ratio rises considerably and the supply of labour becomes inelastic.

This has considerable implications for equity especially in the Less Developed Countries like Nigeria, where only a little proportion of the income is saved even by the dominant classes. Furthermore, in most of these countries, the dominant classes have very high propensity for

prodigal consumption which further reduces the capacity of the economy for capital accumulation (Todaro, 2000)

Another implication of the Lewis model in the Less Developed Countries is its tendency to continuously encourage deficit financing that arises from low level of savings and prodigal consumption to bridge investment. This tendency is by no means unrealistic in view of the need to ensure that capital-labour ratio continues to rise and the supply of labour becomes inelastic.

Finally, this model tends to support the doctrine of urban bias policy in development. Unfortunately, this doctrine is not supported by facts. This is because the model shows that if unlimited supplies of labour are available at constant real wage, and profit is reversed in productive activities, profit will grow continuously relative to national income and capital formation will also grow relative to national income (Todaro, 2000).

In a major shift of analytical direction, Todaro (2000) premised his discourse on the momentum of urbanisation on the assumption that migration is primarily an economic phenomenon, which for the urban migrant can be quite rational despite the existence of unemployment in the urban areas.

Its fundamental premise is that migrants consider the various labour market opportunities available to them in the rural and urban sectors and choose the ones that maximise their expected gain from migration. This expected gain is measured by the differences in real incomes between rural and urban employment and the probability of the migrant securing job in the urban sector.

$$V(o) = [P(t) Y_U(t) - Y_R(t) e^{-rt} dt - C(o)]$$

Where $V(o)$ is the discounted present value of the expected net urban-rural income stream over the migrant's time horizon $Y_{U,R}(t)$ is the average real incomes of individuals employed in the economy; t is the number of time horizon in the migrant's planning horizon and r is the discount rate reflecting the degree of time preference.

$C(o)$ represent the cost of migration. $P(t)$ is the probability that a migrant will secure an urban job at the average income level in period t .

In this respect, the model assumes that migrants do actually compare their expected real income for a given time horizon in the urban sector (value of the difference between return and cost of migration) with their prevailing rural income before embarking on migration. By so doing, the individuals must balance the probabilities of being unemployed or underemployed for a considerable period of time against the positive urban-rural income differentiation.

In this discourse, there is no doubt that the Todaro model has actually reduced the problem of rural - urban migration to that of economic adjustment mechanism in which workers allocate themselves between rural and urban markets. However, a number of policy implications are obvious.

First, it shows that the imbalance in urban-rural development caused by the urban bias development strategies of most Less Developed Countries like Nigeria must be reduced. In view of the fact that workers react to high wage stimulants resulting from urban bias policy that enhance greater urban wage rise than rural wages, growing urban bias will continue to stimulate rural-urban migration even in the face of rising urban unemployment.

Second, the model shows that urban job creation is an insufficient solution for urban employment problem. In other words, the traditional economic solution of creating modern sector urban employment without simultaneous attempt to improve rural income and employment can actually result in higher level of urbanisation and urban unemployment.

Finally, the model does show that with sound programme of integrated rural development, rural-urban migration can be curtailed considerably and the momentum of urbanisation can be controlled. Policies that rely on the demand side of urban employment situation such as direct government employment, elimination of factors price distortions, and employer tax incentives in reducing urban employment in the long run are better than policy designed to regulate the supply of labour to the urban areas.

In this respect, the conclusion is based on the need for structural balance between rural and urban incomes and for changes in government policy that currently give development programmes like provision of health, education and social services, a strong bias towards the urban areas. This will go along way in curtailing rural – urban migration, reduce urban unemployment and enhance rapid development.

2.2 Urbanisation, Economic Growth and Equity

From the foregoing, it is obvious that rapid growth of urban areas in Less Developed Countries is obvious. Survey by Forbes and Thrift (1987) of sixteen largest cities in the Less Developed Countries recorded that annual population growth rates in these cities ranged from 2.4 percent in Calcutta to 8.3 percent in Seoul. Indeed the average growth rate among these countries was a high 5.4 percent, which undoubtedly implies rising population density, congestion, pollution and urban land scarcity. As a result, urban rent rose, living condition deteriorated and delivery of public services become highly problematic. This therefore underlines the fact

that urban economy must not only grow and grow fast but that the benefits must percolate through the whole strata of the society instead of benefiting a few people.

This is also because the rates of urban unemployment and underemployment are continuously on the rise while income distribution is increasingly becoming inequitable. Thus, economic growth has not only failed to improve the quality of life of many urban dwellers, but has also resulted in widespread poverty.

Poverty is defined as a state of inability to attain a minimum standard of living (UNDP, 1994). The poor are characterised by their inability to obtain adequate income, find stable employment and own property. They in most cases, also lack adequate level of education to make them compete in the labour market. They cannot satisfy their basic health needs (Sancho, 1996).

Olayemi (1998) expanded the characteristics to include poor access to food, clothing and shelter, inability to meet social and economic obligations and low self-esteem.

However, a body of theory asserts that highly unequal income distribution is necessary for generating rapid economic growth (Ades et.al., 1999). By so doing, they argue that since inequality is a necessary condition for growth in the long run, maximum growth is a necessary condition for rising standard of living through the process of trickling down of benefits of growth.

The basic framework of the argument is that personal and corporate incomes are necessary condition for saving which make investment and economic growth possible in conformity with the Harrod-Domar model.

In other words, if the rich save and invest significant proportion of their income while the poor spend their income on consumption, and if growth rate is directly related to proportion of the income saved, an economy characterised by an unequal distribution of income would save more and grow faster than one with a more equitable distribution of income.

Conversely, Blejer and Guerrero (1988), shows three reasons why greater equality in Less Developed Countries can self-sustain growth.

First, empirical evidence shows that unlike the historical experience of the developed economy, the rich in contemporary Less Developed Countries like Nigeria are not noted for their desire to save and invest in the local economy. Instead, they are only known to enjoy squandering wealth on imported luxury goods or seek safe haven abroad for their wealth in form of capital flight. Such wealth do not contribute to the growth of the economy and in fact, they represent substantial drain on the economy's productive resources in that income so derived are extracted from the toil and sweat of the poor.

Second, low income and low level of living for the poor are manifested in poor education, poor food and nutritional intake and poor health and sanitation. This does indeed lower economic productivity and slows down the rate of growth of the economy.

Third, raising the income level of the poor will stimulate increase in the demand for locally produced commodities whereas the rich have very high propensity to consume foreign goods.

Rising demand for local goods provides greater stimulants for local production, investment and employment generation besides creating

conditions for rapid economic growth and broader participation in the growth process.

Thus, Olayemi (1998), affirms that in most urban areas of Nigeria, food is the major item of consumption and about 70% of most people income are spent on food. The food itself is not nutritionally adequate, comprising mostly cereals and starch that lack all the basic nutrients required by the body organs to function properly.

Furthermore, according to Olaniyan (1997), housing constitutes another important consumption of the urban dwellers of Nigeria taking a significance part of the income of the people.

But in spite of this significant proportion of the people's income being spent on housing, the incidence of over-crowding is a common place with its associated negative environmental effect in blight, over-use of facilities and general environmental degradation. Higher incidence and severity of rural poverty and the accompanied rural-urban migration aggravate this problem. This continuously exerts tremendous pressure on urban infrastructure to further depress the poverty situation in urban areas and deflate the momentum of the urban economy for significant growth.

Infact, Obadan (1997), characterised the manifestation of poverty in urban Nigeria as a condition of general deprivation whose dimensions include income poverty, social inferiority, isolation, physical weakness, vulnerability, powerlessness and humiliation.

Thus, there is no controversy in literature about the two facets—income and non-income-manifestation of poverty.

Making an analytical presentation of conceptual issues in poverty studies, Obadan (1997), goes further to identify some of the causes of poverty in Nigeria. Some of the identified causes include:

- Inadequate access to employment opportunities;
- Inadequate physical assets, such as land and capital and minimal access to credit even on a small scale;
- Inadequate access to means of supporting development in poor regions;
- Inadequate access to market;
- Low human capital endowment;
- Destruction of natural resources leading to environmental degradation and reduced productivity;
- Lack of participation in development programmes.

In examining the conceptual issues of poverty in urban Nigeria, Aku et. Al. (1997), affirms the fundamental causes of poverty identified by Obadan (1997). They however go further to include cultural and political deprivation as some other fundamental causes of poverty in Nigeria.

They emphasise the consequences of cultural deprivation as the poor not being able to take advantage of economic and political opportunities and take control of their destiny due to lack of access to values, knowledge, information and attitudes.

Similarly, they show that the fundamental source of political deprivation is ignorance because it undermines the poor access to legal institution and ensures that the poor are subject to coercion through physical or economic threat.

Another important issue in the analysis of poverty situation in urban South-West Nigeria is that of macroeconomic outcome of structural adjustment on poverty reduction. Following the Structural Adjustment Programme and

the deregulation of 1987, interest rates were fully market determined and lending rates rose from 10.5% in 1986 to 39.1% in 1993 (Aigbokan, 1997). No doubt, these rises had several important implications for poverty reduction.

First is the cost of borrowing and relative access to capital by the informal sector especially the self-employed entrepreneurs.

Second is the inflationary consequence of structural adjustment. Soludo (1998), shows concluding evidence that increasing percentage of inflation rate in the period between 1987 and 1993 was due to policies under SAP. Unfortunately, in view of the fact that no explicit policy reforms were made for labour and wages during the SAP period, inflation shifted income from labour to capital.

Third, privatisation and commercialisation of public enterprises and rationalisation of public expenditures resulted in retrenchment and layoff of workers as well as embargo on new employment in the public sector.

Following exchange rate deregulation, the Naira rapidly depreciated, producing negative effect on poverty incidence through higher production cost and falling real wages. According to World Bank (1997), urban wages did not only fall by half between 1980 and 1987, wages in the public sector did stagnate.

In an examination of macroeconomic issues in poverty situation in Nigeria, Aigbokan (1997), investigated poverty and poverty reduction using data from 1973 to 1993. He employs the poverty-gap index technique. He found that about 20 percent of urban population is in acute poverty earning less than one-third of the mean income while 45 percent of urban dwellers are in moderate poverty with less than two-third of the mean income. A

similar pattern is displayed in terms of depth and severity of poverty. In fact, the study shows that the depth of poverty is 22 percent higher and severity of poverty is 5 percent higher in urban areas than rural areas.

This submission is in contrast with the general view that poverty is higher in the rural areas of Nigeria than the urban areas (World Bank, 1997).

One interesting outcome of this study is that poverty is higher among professional, technical, administrative and clerical workers than workers in the informal sector. This is explained as being due to the fact that the majority of the former subgroups are wage earners and they suffer more as a result of the decline in wages.

Furthermore, contrary to expectation, this study shows that the incidence of poverty tends to rise with educational level. Core poverty of 1.2 percent, 3.4 percent, 9 percent and 6 percent are recorded for no schooling, primary, secondary and post-secondary respectively in urban Nigeria.

A number of studies have taken a different approach to the analysis of macroeconomic outcome of structural adjustment on poverty reduction in Nigeria (Olaniyan, 1997; Sagbama, 1997). This approach has been the consideration of the objectives of growth, stabilisation, balance of payment, full employment and income distribution and the policy instruments for achieving them. The conclusion of all of them is that the existence of economic dualism, the skewed income distribution, underemployment, disguised unemployment and the existence of frictional, seasonal, cyclical and structural unemployment make the eradication or substantial reduction of poverty in Nigeria unachievable.

In an apparent disagreement with objective assessment concept in poverty studies, Olowononi (1997), argues that poverty concept is a multi-

dimensional sociological situation that transcends economic decision. By so doing, poverty is not only an expression of life situation but also a state of mind and a perception of self in the complex web of social relations. Therefore, he goes further to affirm that any analytical exploration of the concept and definition of poverty is fraught with a number of difficulties.

First, it lacks both precision and universality. It can only be defined meaningfully within a particular setting of time and place. It must also be erected conceptually on the prevailing convention of the society in question.

Second, it is scarcely manifested in a single and unambiguous expression and is more apparent than real and by so doing, there is severe limit to the role of objective measurement in consideration of poverty as a socio-economic phenomenon.

However, in the overall, there is a general consensus that conceptual issues in poverty analysis must identify the forces that determine the pattern of ownership of the factors of production, since it is that pattern which determines the structure of inter-personal differentials in wealth and income in society.

Beyond this, it must also explain the emergence, distribution and persistence of those specific deprivations, which characterises the situation of the poor in the society.

Finally, it must account for the escalation of poverty in a situation of noticeable material and resource abundance such as we have in Nigeria.

Another major cause of poverty in Nigeria is the poor capacity building of the people. In view of the fact that large proportions of the people are

uneducated, lack technical skill, knowledge and entrepreneurial capability, resource endowment tends to be underutilised, or even unutilised. The people are not adequately prepared for the complex nature of economic initiatives and are conditioned to rely on the state in one form or another for socio-economic improvement in the face of highly unequal distribution of income.

Usually, given a country resource endowment, its level of poverty is supposed to be inversely related to its level national income. Unfortunately in Nigeria, growing national income is not in anyway a guarantee for lower level of poverty (Sagbamah, 1997).

Thus, an understanding of the nature of economic growth in urban Nigeria cannot be enough to enhance poverty reduction strategy since any gain in income arising from national economic growth may not adequately trickle down to the poor to sustain effective poverty reduction policy. By so doing, the only remaining option is to attack poverty directly through the understanding of its location, dimension and characteristics.

2.3 Issues Associated with Concept of Economic Development

The complexity and diversity of the concept of development and its accompanying economic, social and cultural cleavages and forces makes it imperative to identify the germane issues that lie behind this concept and explore how such issues have been tackled in literature.

The range of discussions on issues of economic development does cut across many areas. However, for the purpose of this study, we are guided by the objectives, hypotheses, scope, theory and methodology intended in the study.

Essentially Todaro (2000), listed the characteristics of underdevelopment as:

- I. Low level of living, characterised by low incomes, high inequality, poor health and inadequate education;
- II. Low level of productivity;
- III. High rate of population growth and dependency burden;
- IV. High and rising levels of unemployment and underemployment;
- V. Substantial dependence on agricultural production and primary product exports;
- VI. Prevalence of imperfect market and limited information;
- VII. Dependence and vulnerability in international relations.

In addition, Jhingan (1998) included:

- i) A dualistic economic system;
- ii) Underdeveloped natural resources;
- iii) Technological backwardness.

But nevertheless, the range of discussions on issues of economic development in literature cut across more than these areas. One of the main issues of development today is that poor countries are attempting to accelerate their development from a lower economic level than was true for the presently developed countries at the time of their rapid development. According to King and Lerme (1994), not only do poor countries now confront the strategic policy issues of development from a level of per-capita income absolutely lower than that in the advanced countries when they were developing, but their relative positions are also inferior to those other countries.

In this respect, two conclusions do emerge. First is that Less Developed Countries are either currently at some earlier stage within the long term trend of the presently developed countries or that they are at some stage in

a sequence of long term growth separate and distinct from the presently developed countries (Meier, 1989).

In examining the role of agriculture vis-à-vis industrial development in the process of development, Lassard and Williamson (1987), show that many poor countries have not yet experienced any significant degree of agricultural improvement as a basis for industrialisation. They show that the failure to have agricultural revolution makes the present problem of accelerating development far more difficult than it was for the now developed countries when they started developing.

In the same vein, population pressure in Less Developed Countries is increasingly becoming a barrier to development. By so doing, there is a general consensus that unlike in the past in which population growth was induced by a higher rate of development, the present growth in population is a result of introduction of public health measures.

Thus, given that the Less Developed Countries are already experiencing population growth rates that are far higher than those that confronted the currently rich nations when they were in their early phases of development; and that the Less Developed Countries may face population problems in a relatively short time, the need to attain increase in production sufficient enough to outstrip potential increase in population is now more acute than it ever was when the present developed countries started developing.

One important but controversial issue in literature regarding measurement of development and underdevelopment is the employment of measurement indicators for identified variables of development.

Meier (1989), shows that one of the methods of measuring economic development is in terms of increase in real national income over a long

period of time. Expectedly, this measurement variable is seriously questioned because it fails to account for growth in population and it does not reveal the costs of environmental pollution, urbanisation, industrialisation and population growth to the poor (Jhingan, 1998).

One area of convergence of agreement in literature is the use of per-capita real income as a measurement variable of development. Meier (1989), defines economic development "as the process whereby the real per-capita real income of a country increases over a long period – subject to the stipulations that the number of people below absolute poverty line does not increase and that the distribution of income does not become more unequal" indicating that the rate of increase in per-capita real income should be higher than the growth rate of population.

However, in spite of the wide acceptability of per-capita income as a veritable measure of economic development, Jhingan (1998), observed that per-capita real income fails to take into account problems associated with basic needs like nutrition, health, sanitation, housing, water and education. It also subordinates other questions regarding the structure of the society, size and composition of its population, its institutions, and culture, the resource-use pattern and even distribution of output among members of the society.

The failure of per-capita real income to take account of societal welfare led to the development of social indicators, which are often referred to as the Basic Needs indicators.

Thus, literature agrees that the merit of social indicators is that they are concerned with the ends – and the ends being human development.

In this respect, two or more social indicators have been used to construct composite indices of human development. The indices include the Human Development Index (HDI) of UNDP (1996) and Physical Quality of Life Index of Morris and Liser 1977.

The HDI is a composite index of achievements in three fundamental dimensions, namely a long and healthy life, knowledge and a decent standard of living. It is a simple average of life expectancy index, educational attainment index and the adjusted real GDP per-capita index. The HDI ranks countries in relation to each other. Thus, countries with HDI value below 0.5 are considered to have a low level of human development, those between 0.5 and 0.8, a medium level and those above 0.8, a high level.

The HDI has been criticised for measuring relative rather than absolute human development and for shifting focus away from high inequality found within a country (Jhingan, 1998).

Morris and Liser (1977), constructed a composite Physical Quality of Life Index (PQLI) relating to 23 developed and developing countries for a composite indicators of infant mortality, life expectancy at age one and basic literacy at age 15 to measure performance in meeting the most basic needs of the people.

Each of the three indicators is placed on a scale of 1 to 100. The PQLI is calculated by the average of the three indicators giving equal weight to each.

According to Morris and Liser (1977), each of the three indicators measures result and not inputs and are therefore sensitive to distribution effect.

In this respect, an improvement in any of the indicators signifies an increase in the proportion of people benefiting from them.

However the Physical Quality of Life Index is a limited measure of basic needs because it does not measure economic growth and does not explain the changing structure of social organisation. But in spite of this, the PQLI has been used to identify particular areas of underdevelopment and groups of society suffering from neglect or failure of social policy (Jhingan, 1998).

The Physical Quality of Life Index (PQLI) is adapted in this study to determine the levels of Sustainable development and Urban blight in urban South-West Nigeria.

Literature on economic development has been dominated by five major but competing strands of thought; namely the linear stage of growth model, theories of structural change, the international dependence revolution, the neo-classical free market counter-revolution and the new growth theory.

Economic theory in the 1950s and early 1960s views the process of development as a series of successive stages of economic growth through which all countries must pass (Todaro, 2000).

It was out of this intellectual environment emerged the Rostow's stages of growth. Rostow (1960) emphasised that it is possible to identify all society in their economic dimension, as lying within one of five categories: the traditional society, the pre-condition for take-off into self-sustaining growth, the take-off, the drive to maturity and the age of mass consumption.

However, Rostow's stages of development have been widely criticised at each of the stages and important is the doubt about the division of economic history into five.

The Harrod-Domar growth model emerged from the criticism of Rostow's stages of growth because it emphasises that one of the principal tricks of development necessary for any take-off was the mobilisation of domestic and foreign savings in order to generate sufficient investment to accelerate economic growth.

In this respect, the contributions of Harrod (1939) and Domar (1946) have enormous influence on literature of growth in both the developed and less developed economies.

Harrod-Domar models are intended to discover the rate of income growth necessary for a smooth and uninterrupted working of the economy. The models emphasises the dual characters of investment as a creator of income and the augments of the productive capacity of the economy. As long as net investment is taking place, real income and output would continue to expand. But to maintain full employment, it is necessary that both real income and output expand at the same rate at which the productive capacity of capital stock is expanding. Otherwise any divergence between the two would lead to excess or idle capacity forcing entrepreneurs to curtail their investment expenditure.

In other words, if full employment is to be maintained in the long run, it is necessary for real income to grow continuously at a rate sufficient enough to ensure full capacity use of a growing stock of capital. This rate of income growth is the warranted rate of growth of Harrod and full capacity rate of growth of Domar.

Savings (S) is some proportion s of national income Y then

$$S = sY \quad \dots 2.1$$

Investment I is the change in capital stock K

$$I = \Delta K \quad \dots 2.2$$

However, total capital stock has a direct relationship with income or output Y and it is expressed as the capital -output ratio K .

$$\frac{\Delta K}{\Delta Y} = k \quad \dots 2.3$$

$$\Delta K = k \Delta Y \quad \dots 2.4$$

Similarly, $S = I$

Therefore,

$$I = \Delta K = k \Delta Y \quad \dots 2.5$$

$$S = sY = k \Delta Y = \Delta K = I \quad \dots 2.6$$

$$sY = k \Delta Y \quad \dots 2.7$$

The economic logic is thus that for any economy to grow, it must save and invest a certain proportion of its GNP and the more they save and invest, the faster is the growth.

Having defined the natural rate of growth as "the maximum rate of growth allowed by population, accumulation of capital, technological improvement

and work/leisure preference schedule, even if there is full employment, the achievement of a balanced growth path is only available by chance and it is unlikely to be maintained if achieved.

Although the model is able to establish three equivalent but alternative ways to establishing balanced growth namely – the malleability of technology represented by the capital-output ratio, the saving rate and the natural rate of growth.

Jones (1995), criticised it for ignoring the effect of government programmes and the behaviour of entrepreneurs in the determination of the warranted growth and for not being able to distinguish between consumer and capital goods.

The structural change theory focuses on the mechanism by which Less Developed Countries transform their domestic economic structures from heavy emphasis on traditional subsistence agriculture to a more modern and more industrially diverse.

In this respect, the Lewis theory of unlimited supply of labour focus on the structural transformation of a primarily subsistence economy. It emphasis that economic development takes place when capital accumulates as a result of withdrawal of surplus labour from the subsistence sector that uses reproducible capital (Lewis, 1954).

Thus, Lewis (1954), introduced the model that shows that economic growth takes place when capital accumulated as a result of withdrawal of surplus labour from subsistence sector to the sector, which uses reproducible capital. It is based on the assumption that labour supply at subsistence wage is perfectly elastic. In this regard, new industries can be established while existing ones expanded without wage limitation.

Capital accumulation is realised because the marginal productivity of labour in the capitalist sector is higher than the capitalist wage. This surplus is reinvested in new capital projects and the process continues until capital-labour ratio rise and the supply of labour becomes inelastic.

However, Leisten (1967), attacked the model for being one sided, for not considering the possibility of technical progress in the agricultural sector, for taking labour mobility for granted and for considering skill labour as a temporary economic growth setback that can easily be solved.

Out of the disenchantment for the stages and structural-change models in the third world emerges the Dualistic-Development theory of Jorgenson (1967). The theory is based on the notion of a society of dualism with pocket of wealth within broad areas of poverty. It represents the existence and persistence of increasing divergences in the rich and the poor sectors of the economy, which essentially represents the agricultural, and the manufacturing sector. For the agricultural sector, it is characterised by constant returns to scale with all factors variable as given by the Cobb-Douglas production function.

$$Y = e^{\alpha t} L^{\beta} P^{1-\beta} \quad \dots 2.8$$

Y represents agricultural output, $e^{\alpha t}$ is technical change which takes place at a constant rate (α) in the time (t) L is the fixed quantity of land available. β is the share of landowners in the product, P is the population and $1-\beta$ is the share of labour.

Since land is fixed, equation 2.8 becomes

$$Y = e^{\alpha t} P^{1-\beta} \quad \dots 2.9$$

$$Y/P = e^{\alpha t} P^{-\beta}$$

$$y = e^{\alpha t} P^{-\beta}$$

Differentiating with respect to time

$$d y = \alpha e^{\alpha t} P^{-\beta} + e^{\alpha t} (-\beta) P^{-\beta-1} d p \quad \dots 2.10$$

Where:

α is the rate of technical progress,

β is the rate of landowner's share, and

e is the net reproduction rate

Thus, the necessary and sufficient condition for a positive growth of output in this sector is $\alpha - \beta e > 0$.

The policy implications of the analysis is that a backward agricultural economy with a low level equilibrium trap can get out of the trap by increasing the rate of technical change α provided β remains constant or reduce reproduction rate of population so long as α is greater than e .

For the manufacturing sector, the production function is based on a constant return to scale.

$$X = f(K M t)$$

Where X = manufacturing output

K = the capital stock

M = the manufacturing labour force and

t = time.

If the relative share of labour in manufacturing output is constant and all technical change is neutral, the production function becomes

$$X = A(t) K^\sigma M^{1-\sigma} \quad \dots 2.11$$

Where:

$A(t)$ is a function of time,

σ is the relative share of capital k

$1-\sigma$ is the relative share of labour force M .

If the rate of growth is constant, then

$$\frac{\dot{A}}{A} = \lambda$$

$$A$$

$$\dot{A} = \lambda A$$

Solving as differential equation

$$A(t) = e^{\lambda t} A(0)$$

Substituting the value of $A(t)$

$$X = e^{\lambda t} A(0) K^\sigma M^{1-\sigma} \quad \dots 2.12$$

Dividing X and K by M and representing output and capital per man by x and k respectively and changing the units of X so that $A(0)$, the production function, becomes

$$x = e^{\lambda t} K^\sigma \quad \dots 2.13$$

This represents the technical progress function, which expresses output per man as a function of capital per man.

The Keynesian theory made the saving rate an equilibrating variable that varies with the rate of growth and as the distribution of income varies, so too does the overall saving rate. This allows the warranted rate of growth to adjust to the natural rate. This is the direction followed by Kaldor (1974).

He shows that the share of profit to income, the rate of profit to investment and the real wage are functions of investment-income ratio and are determined independently by profit-income ratio (Kaldor 1974). But this assertion is true only under conditions that real wage is not below the level necessary to induce investment and that capital-output ratio is independent of the rate of profit (Jhinghan, 1998).

However, Khan and Renhart (1990), criticised the theory for ignoring the impact of technical progress on profit and income distribution as well as its assumption of a rigid production function that does not allow any substitution between factors.

Secondly, the model is said to be unrealistic because it does not consider human capital, which plays important role in growth as well as functional and size distribution of income as being very important.

Fei and Ranis (1961), develop model of growth for resource poor and labour surplus economy in which wide majority of the population are engaged in stagnant agriculture amidst widespread unemployment and high population growth.

Based on the assumption of economic dualism, Fei and Ranis (1961), analysed the development of such economy in two phases. In the first phase, the disguised unemployed agricultural workers are transferred to the industrial sector at the constant institutional wage.

This model is an improvement on the Lewis model because it shows the interaction between the agricultural and the industrial sector while the Lewis model ignores the development of the agricultural sector. But Bagawati (1983), discovered that its main weakness is its emphasis on constant institutional wage above the Marginal Physical Product (MPP) in the agricultural sector.

Nurske (1961), developed the model turning disorganised unemployment in overpopulated and underdeveloped economy into saving potential.

It is based on the notion that there is a large quantity of labour in agriculture, which can be diverted to the industrial and other sectors of the economy without reducing the efficiency of agricultural production or food intake of the population. By so doing, savings can be generated since enough food can be produced to feed all the available labour while the unproductive labour can be made productive by engaging them in other sectors.

Although Denison (1967) attacked it for being very limited in concept and for assuming the retention of productivity in agriculture after large quantity of labour has been removed, when in fact in Less Developed Countries, farming is usually subsistence in nature. Furthermore, it failed to consider the effect of lack of skill of the unproductive labour on their mobility and industrial efficiency.

The concept of critical minimum effort to economic growth is the contribution of Lebeistein (1967). He emphasised that a critical minimum stimulus is required to raise per-capita income to the level in which growth can be sustained in less developed economy.

According to this model, every economy is subject to "shocks" and "stimulants". While a shock tends to reduce per-capita income initially, a stimulant tends to increase it. It is only when the income raising factors are stimulated more than income reducing factors through the development of growth contributing activities that increase in entrepreneurship, stock of knowledge, expansion of the productive skills and increase in the rate of savings and investment can be realised.

This model has been adjudged to be consistent with the idea of economic planning through which the critical minimum stimulants can be properly timed and broken down to smaller stimuli that can put the economy into the path of sustained growth.

Unfortunately, the model has been attacked for failing to take into account the element of time, which is required for sustained effort during which fundamental changes in institutional and productive structures should take place (Jones, 1975).

In the 1980s, the political ascendancy of conservative governments in the United States, Canada, Britain and Germany brought with it a neoclassical counter-revolution in economic theory and policy.

The central argument of the neoclassical counter-revolutionists is that underdevelopment results from poor resource allocation due to incorrect pricing policies and too much state intervention (Todaro, 2000).

It argues that by permitting competitive free trade and privatising State owned enterprises, promoting free trade and export expansion, welcoming foreign investors and eliminating the plethora of government regulations and price distortions in factor, product and financial markets, economic efficiency and growth can be stimulated.

Thus, the basic neoclassical model introduced by Solow (1956) and Swan (1956), provides the answer to the knife edged equilibrium of Harrod (1939) and Domar (1946). The Solow-Swan growth model predicts that the level of income will be determined by the prevailing technology as embodied in the production function and by the rates of saving, population growth and technical progress, all of which are assumed exogenous.

The essential element of this model besides the concave, twice differentiable production function is the neoclassical presumption that fluidity of factor prices keeps the economy on its production boundary so that the long run evolution of the economy depends either on the evolution of inputs through time or on the shift in the production function itself through time.

Solow (1956), determines the time path of capital accumulation that must be followed if all available resources are to be fully employed and the time path of real output fully realised.

Meanwhile, the neoclassical model has been criticised for its inability to explain observed difference in economic growth across countries. However, Mankiw et.al. (1992) casts doubt on this criticism. Their work concludes that the neoclassical predictions are indeed supported with empirical findings.

Knight et.al. (1993) modified the Mankiw et.al. (1992) work to include a country's trade policy and public investment in domestic economy. They reported that investment in human capital have direct positive impact and are more quantitatively important when open trading environment and better public infrastructure are in place. But a restrictive trade system affects growth negatively through its impact on rate of investment.

The poor performance of neoclassical theories in illuminating the sources of long term economic growth and the growing third world debt crisis make it very clear that it is at a loss to explain the dramatic disparities in economic performance across countries. Thus, the anomalous behaviour of third world capital flows provides the impetus for the development of the endogenous growth theory.

Models of endogenous growth discard the neoclassical assumption of diminishing marginal returns to capital investment, permit increasing return to scale in aggregate production and frequently focus on the role of externality in determining the rate of returns on capital investment and human capital, generate external economies and productivity improvement that offset the natural tendency of diminishing returns.

Endogenous growth theory seeks to explain the existence of increasing returns to scale and the divergent growth pattern among countries.

Secondly, the dissatisfaction with the neoclassical model arises because it has the characteristic that the long-run rate of growth is determined by exogenous natural rate of growth. As the economy is always presumed to be on its production function and as the production function display returns to scale with diminishing returns to both capital and labour, excessive growth of either input generates diminishing returns, the long-run rate of growth is therefore constrained by the growth rate of the more limited factor. As capital is assumed to be the only accumulable factor, output growth is limited by the rate of growth of labour.

One solution is to change the specification of the production function so as to avoid diminishing returns to the accumulable factor-capital. This has received its most clear-cut statement in the "AK model" associated with Rebelo (1991).

Another solution is by introducing a shift parameter, which moves the production function through time. The endogenous growth literature makes the shift parameter a function of the other variables in the model.

This is considered as human capital by Renelt (1991), which he allows to accumulate at a rate determined by investment in education.

This assertion is corroborated by Mankiw et al. (1992), which in spite of their empirical support for neoclassical theory further argued that if human capital is not accounted for, the quantitative implications of different savings and population growth would be biased upward.

In the same vein, adjustments to growth models have highlighted the importance which investment in human capital play to the realisation of economic growth. For instance, much of the neo-classical growth models are anchored on a constant returns to scale production function. If capital

K rises faster than labour L as it is expected to, then with diminishing returns to K as K/L rises, the returns to investment should gradually diminish. But the extension of growth models to include exogenous technical progress, which essentially is human capital, will shift the production function outward and enhance the rate of returns to investment.

In the new growth model, human capital is endogenised in a three factor production function where human capital acts to keep up the return to physical capital in a production function that postulate increasing returns to scale. The implication of both models is that human capital is very crucial for sustained economic growth and development.

Indeed, Soludo (1998), affirms that investment in human capital in terms of education, health and general welfare do matter for growth and development in Africa. But unlike physical capital, human capital does appreciate with use and depreciate with under-use and misuse.

In other words, when human capital is being put into challenging use, economic growth is sustained and the stock of capital increases. But when human capital is being depleted through severe unemployment and underemployment, the depletion gradually depresses growth and the stock of capital, given the established causality between economic growth and level of investment.

The concept of human welfare as a critical factor in the realisation of economic growth is the premise of the Basic Needs paradigm (Jhinghan, 1998). It is hinged on the notion that meeting basic needs requirement of citizens through massive investments in education, public health, communication, transportation and public utilities like power, irrigation, drainage schemes can lay a more effective foundation for sustained growth. This is because of its expected impact on the structure of domestic

demand and its induced investment potentials without which primary, secondary and tertiary productive activities can function (Hirschman, 1988).

In other words, there is a positive correlation between meeting basic needs on the one hand and growth, structural change and greater self reliance on the other hand; such that the structure of demand would be affected in ways that would induce and increase the qualitative change in aggregate investment which would not be affected by balance of payment constraints.

Such would prevent permanent leakages from national income through capital flight and generate a more equitable distribution of income by providing the basis for linking development of labour in agriculture, small-scale manufacturing, service enterprises and large-scale modern industrial production.

The basic framework of analysis of the Basic Needs paradigm lies on the analysis of the level and composition of demand and their determinants and the implications of human capital formation on pattern and level of growth.

However, Collier (1997), criticised the model for its weakness in considering the internal inflexibility of resources in underdeveloped economy, which often leads to immobility of factors.

Furthermore, one of the serious limitations of the model is the tendency of inflationary pressure within the economy. When large doses of investment are being injected into an economy at certain strategic points, income may rise, which may tend to increase the demand for consumer goods relative to supply resulting in shortages (Lai 1990).

Furthermore, it can also enhance the conflict between equity and growth maximisation and a possible perpetuation of technological backwardness. It has also been argued that increased inequity in a growing economy provides the necessary incentive for individual entrepreneur, which may be destroyed by the Basic Needs paradigm.

In spite of these criticisms, the model has been recognised as a successful idea for economic growth in some underdeveloped economy. Russia adopted it and has been successful in accelerating its rate of economic growth (Jhinghan, 1998).

The Big Push concept is based on the theory that a minimum but large and comprehensive investment is required to overcome obstacles to growth in an underdeveloped economy (Sen, 1981). The theory identified the indivisibility of social overhead capital, complementarity of demand and high income elasticity of savings as critical factors for sustained growth.

The major contribution of this model is its identification of a minimum quantum of investment that can catapult an underdeveloped country.

In this respect, empirical analysis of growth and investment in LDC was done by Robinson (1977). He concluded that a large public investment promotes economic growth. Similarly, Conter and Darrait (1988) using a Granger type causality approach for OECD countries concluded that public sector expansion was not responsible for decline in real growth among the countries in the period between 1960-1984.

In Nigeria, Aigboka (1996), using a simple growth equation concluded that gross capital formation and labour has a positive impact on economic growth. While the externality effect of government spending is found to be

positive on the growth process, the overall impact of government spending is found to be negative.

Furthermore, Iyoha (1998) and Ariyo (1998), pontificate that investment is a necessary condition for growth and that up to eighty percent of the component of any national economic growth is derived from real direct investment.

In fact, Collier (1997), provides an interesting insight into the prerequisites for investment and growth. He identified three criteria, which forms the minimum condition for attracting investment for the realisation of growth. These are namely a minimum degree of social stability, a minimum degree of macroeconomic stability and a minimum degree of allocative efficiency.

In essence the realisation of a minimum degree of allocative efficiency presupposes stable macroeconomic environment, which also presupposes stable social order.

In this respect, there is no denying that Nigeria's economy is operating in an environment that is devoid of minimum conditions for productive investment.

The absence of minimum investment climate portends "risks that are associated with safety and productivity of investment. Serven (1996) enumerated three considerations for investment given a climate of risks for safety and productivity of investment. First is that because most fixed capital investment are irreversible, the cost of bad investment decision is raised as a result of difficulty in recovering part of the sunk cost.

Second is that as a result of plethora of uncertainties induced by volatile macroeconomic environment, future returns on investment are uncertain.

Third, is that there is a value to exercising the option to wait and that profitability of investment is determined when the expected returns exceed not only the capital but also the waiting value option. In other words, investors are likely to wait to exercise their waiting option until the front loading of incentives is adequate to compensate for any risk and uncertainty associated with long term investment commitment.

Moreover, flow of investment into an economy is also influenced by a number of other factors (Bigsten, 1996). These include size of domestic market, capacity utilisation, fiscal deficit and inflation, exchange rate velocity, interest rates, economic policy measures and institutional factors.

The implication of these is that a country like Nigeria may be privatising, commercialising and liberalising, it is ultimately the investor's perception of risk associated with safety and productivity, rather than levels of key macroeconomic variables that matter most in their assessment response (Soludo, 1998).

2.4 Conceptual Issues in Sustainable Development

Sustainable development has often been defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their needs. In this respect, the general concept of sustainable development does necessarily incorporate a range of considerations and elements that are by no means integral part of development. These considerations and elements include gender, human rights, democratisation, culture, traditions, beliefs, norms and values and other aspects of human development, in addition to the interface of economic activities and its accompanying growth and nature of equity.

However, for the purpose of this study, and in order to reduce the intractability of a complex concept, we have made the context and

dimension of our literature review to be guided by the objectives, scope, theory, hypotheses and methodology intended in the study.

In this regard, we have confined our concept of sustainable development to a result of the interface of human economic activities and its impact on the environment in the process of societal pursuit of developmental goals and objectives. By so doing, we have narrowed our definition of Sustainable development to refer to an economy in which future development is not compromised as a result of the present growth of the economy.

The rapid expansion of Nigerian urban economy at the height of the oil boom was not considered to be inimical to urban environmental preservation and general environmental protection by the government. It was believed that rapid economic expansion and its resulting development would rub off on the environment by engendering equitable distribution of income, improve social and economic welfare and empower the majority of the people. It would particularly be beneficial to the urban dwellers that are the main beneficiaries of economic expansion thereby improving environmental protection. But two important factors were not considered in reaching this conclusion.

First is that economic expansion means more output and in the process requires more inputs, which invariably are obtained from the resources of the environment. In essence, Nigeria's economic expansion was inadvertently undertaken by depleting the renewable and non-renewable natural resources of the country.

Thus, our approach to review of literature in respect of these issues is based on the growing universal concern that continued economic expansion will cause irreparable damage to the environment and reduced the quality of life of future generations. This concern is based on two

notions. First, that more output requires more inputs and as a result, the earth natural resources will inevitably be depleted by continued growth of production and consumption.

In most cases, the resources provided by the environment are apparently fixed and using it in one form places a limitation to its being used in another form. In other words, the environment itself is a scarce resource with many conflicting demand placed on its use.

Demand arising from this scarcity is a relative demand, which can be resolved by a set of shadow pricing. But in period of economic growth, there is a general increase in demand for all environmental resources resulting in absolute scarcity.

Second is that more output usually results in more emissions and wastes and so the earth absorptive capacity will inevitably becomes overburdened as a result of continued economic growth.

Furthermore, the economic expansion in Nigeria did not consider environmental factor as being very crucial for economic policy design and implementation. In this respect, environmental consideration was not an issue in the choice of technology and even location of industries. By so doing, the production of more output led to more emission and wastes generation and urban South-West of Nigeria environment gradually became over-burdened as a result of the economic expansion (Agbu, 1997).

It is postulated by Daly (1990), that given the socio-environment condition such as obtain in urban South-West Nigeria, there is a real possibility that wastes and emissions from economic activities may exceed the carrying capacity of the biosphere with dire consequences for human well-being.

It is also postulated by Daly (1990), that even when economic activities are declining, wastes and emissions from such activities may exceed the carrying capacity of the biosphere once the technology is not environmental friendly, and natural resources conservation is not a priority.

In this aspect, the work of Grossman (1994), is very pertinent. Grossman noted that the scale of economic activities is but one determinant of the rate of depletion of natural resources and production of wastes materials and gases. Equally important are the composition of economic output and the techniques used to produce it. He develops a simple decomposition model, which represent the relationship between scale of economic activities and the amount of wastes generated per unit of output:

Total emission of some pollutant at time t are given by

$$E_t = \sum_i a_{it} S_{it} + Y_t$$

Over time, emissions will evolve according to

$$\hat{E} = \hat{Y} + \sum_i \lambda_i S_{it} + \sum_i \lambda_i a_{it}$$

Y_t represent the scale of economic activity at time t , S_{it} , share of output deriving from sector i and a_{it} the amount of waste or pollution generated per unit of output in sector i .

Where λ_i is the rate of change of the share of total amount of emissions of the pollutant generated by economic activity i .

Thus \hat{Y} represents the rate of change of the scale effect indicating that an increase in output resulting in equi-proportionate increase in pollution.

$\sum_i \lambda_i s_i$ represents the composition effect indicating that emissions

may fall if the shares in GDP of relatively cleaner economic activities rise over time and $\sum_i \lambda_i a_i$ represents the technique effect indicating rate of technological progress leading to market induced substitution to cause less polluting technologies to replace dirtier ones.

Carraro and Simiscalo (2000), used a barrage of data from the international station of the Global Environmental Monitoring System (GEMS) owned by the World Health Organisation (WHO) and the United Nations Environmental Programme (UNEP), to regress estimated quantity of pollution emission on real per-capita GDP of the GEMS participating countries.

They concluded that economic growth does not always contribute to environmental degradation. In fact, in some cases, economic growth has been accompanied by a change in the composition of output and methods of production that more than compensates for the increased scale of environmental degradation activities.

To the extent that economic growth is linked to environmental degradation, Grossman (1994) shows that income is also important. This is because for most pollutants, an inverted 'U' shaped relationship between income and the environment is identified. In other words, environmental quality deteriorates in the early stages of economic growth but improves with higher levels of per-capita income.

Essentially, the broad objective of sustainable development is to find the optimal level of interaction between three systems namely the biological and resource system, the economic system and the social system through a dynamic and adaptive process of trade-off. Thus, sustainability is

operational when it is applicable to all forms of economic and social activities. In this respect, a broad consensus does exist about the concept of Sustainable development. The first being a wider concept that is concerned with sustainable economic, social and ecological development,

Sustainable development is therefore the sustained production, sharing and preservation of resources for the common good. In other words, for Sustainable development to be realised there must be strong economic regeneration that can bring about simultaneous realisation of equity and efficiency in economic development. This must involve the protection of human skills, dignity, resources and the environment. Krantkraemer (2000).

In essence, sustainable development is realised from the totality of responsible behaviour towards consumption, production, investment and distribution of wealth and resources resulting in policies being directed towards meeting the needs of the people along productive lines while guaranteeing their basic needs.

Sustainable development is based on the principle that efficiency and equity are simultaneously attained and are inseparably together with environmental protection, absolute poverty elimination and productivity.

It must be based on the determination of a people to invest some proportion of its Gross National Product in life sustaining activities for the welfare of its future generation to ensure that there is no decline in inter-generational standard of living.

From the work of Grub (1991), there are two inter-linkages between economics and the environment. Every economic action has its effect on the environment and every environmental action has its effect on the economy.

The economy refers to the population of economic agent and economic institutions like the firm and the government and inter-linkages between agents and institutions like the market.

The environment comprises of the bio-sphere, (the thin skin of the earth surface) the geo-sphere (the part below the bio-sphere, the strato-sphere (the high atmosphere) the tropo-sphere (low atmosphere) and the flora and fauna.

The environment performs five main functions as follows:-

- i) It provides non-renewable resources for mankind.
- ii) It provides renewable resources for mankind and other living organisms in the environment.
- iii) It absorbs waste generated from human and to lesser extent other living organisms activities.
- iv) It transforms some harmful pollutants to harmless materials.
- v) It provides energy for survival.

The environment is one of the most crucial aspects of Sustainable Development because it is the main determinant of the rate of utility of development by both the present and future generation. In other words, it is one of the major determinants of intra-generational and inter-generational equity.

The works of Grub (1991) and Morris (1994) show that the environment is enhanced when environmental problem is tackled early. It usually leads to no trade-off between efficiency and equity, consequently enhancing the availability of primary resources and labour productivity.

The second concept of sustainable development is a more narrowly defined concept that is largely concerned with environmental sustainable

development which in other words is the optimal resource and environmental management over time (Barbier, 1989c).

Although economics plays a crucial role in environmental preservation, the market system is relatively impotent in addressing resource allocation of the environment because of market failure (Pindyk and Rubinfeld, 1989).

There are many causes of market failure arising from the environment:

- a) **Incomplete Market:** This is when market players cannot create a well-defined property rights system for products.
- b) **Externalities:** This is when the consumption or production activities of an individual or a firm affect another person's utility or another firm's production function so that the condition of a Pareto optimal resources allocation is violated. Market failure is enhanced because externalities do not work through the price system but rather through its impact on utility or production since the agents creating externalities do not pay for imposing external cost.
- c) **Non-Exclusion and the Commons:** Market failures do also occur when it is impossible or very costly to deny people access to environmental assets. Every individual has an incentive to capture as much benefit as possible resulting in over-use of the resources and the environment.

In this respect, the link between economics and the environment is believed to be driven by the demand of people for environmental policy changes since many environmental problems arise from regenerative and non-market resources whose property rights are difficult to establish.

2.5 Factors Determining Sustainability of Development in the Urban Environment

There are wide range of discussions about the relationships and effects of urban settlements to environmental quality and sustainable development. One clear consensus about these discussions is that the problems of sustainable development in urban settlements are multifarious but essentially, they have to do with the reckless abuse of atmospheric and environmental resources especially in Less Developed Countries (LDC) like Nigeria.

One unique aspect of this abuse identified in literature is the atmospheric characteristics of urban area in relation to houses and ventilation, ambient environmental situation in air, water and noise pollution and the micro climate of the environment of the areas surrounding urban centres.

Literature has identified urban climate as a typical product of human activities and its analysis has been considered to be important in seeking solution to the problems of human comfort and energy in urban areas.

It identifies the urban centre as representing the areas where mankind has altered, the essential resources of land, water and air and thus provides the most extreme microclimate modification that have ever been created.

The creation of urban centres provides the modes of man's greatest impact in destroying the existing microclimates and creating new ones which are of great complexity depending on the design of the urban centre structures, density and the various activities performed by man in the centre.

In this respect, Okoola (1990) identified the uncontrolled flow of migrants to cities as putting excessive pressure on high priority services such as sewage, water supply and even education, leading to environmental

degradation in urban areas of Kenya. In addition, many types of urban human activities such as industrialisation, power plant operations and changes in land use pattern usually result in inadvertent modification of the local weather. Chief among this impact is the high temperature within the urban centres compared to the sub-urban region.

In the context of Nigeria, Odemerho (1988), analysed the aspect of urban Lagos. In a very strong discourse, he avers that Lagos represents a typical urban centre whose location, growth and development have been determined by some combination of strategic, social and economic considerations and whose effects have been considerable on the urban climates. Specifically, the urban structures of Lagos, the changes in the characteristics of the urban active surface and the various activities in the urban centre have had considerable impacts on the characteristics of the climate and climatic components. Thus, the composition of the atmosphere, the energy and water budget components of the city of Lagos has been modified.

The demographic dimension of growth, environment and Sustainable Development is the focus of Balwins (1994). His premise is that people make pollution and poverty makes people. Using data that combine world population, birth rates, death rates and emission, the study shows that while most Less Developed Countries (LDCs) like Nigeria are near the end of the explosive phase of their demographic transition they are beginning the rapid emission growth phase of the ecological transition. As a result, environmental damage in countries like Nigeria is likely to increase before it declines.

But more importantly, the study shows that the heavy mass of population in many Less Developed Countries like Nigeria will experience lower population growth but rising pollution flows. The result being that income growth in these countries would stall at the point where they are in high

emission stage. This is likely to produce population growth that put considerable strains on domestic resources and emission growth that puts considerable pressure on the environment. This argument is used to defend population control effort and abatement policy in low-income countries like Nigeria.

Thus, the demographic dimension of the works of Balwin (2002), highlights the fact that rising average income and output levels cannot be an unmitigated panacea for environmental degradation.

Therefore, the extent to which developing countries like Nigeria will be associated with environmental degradation depends critically on policy. According to Balwin, policies, which reduce demographic pressures, are vital elements in Sustainable development. In this respect, improvement in employment, education and training, social security and general human capital development entail significant positive externalities for the environment.

Similarly, the relationship among poverty, demography and environment is well grounded in the of work Bercker (1992). By adapting the theory of demographic transition of Laundry (1934), he postulates that in the second phase of demographic transition, the death rate drops quickly while the birth rate stays constant or even rises. The drop in the death rate is due to technical advances in public health and medical care and perhaps to agricultural and industrial productivities. Since these factors reduce death rate but not birth rate, life expectancy increases resulting in rapid rise in population and perhaps a built-in population momentum.

However, at a later stage of this phase, fertility decline may be experienced, driving increased stock of human capital and caused largely by socio-economic factors of rising level of education and increased female participation in the work force.

But this may not be automatically translated into reduced poverty and improved environment. According to its proponents, there is a simple economic trade-off between fertility and human capital development because child bearing and rearing is a time consuming activities that provide parents with utility. This accounts for the negative correlation between fertility and household income.

In an appraisal of the earth absorptive capacity Meadows et.al. (1972), observe that the earth is finite. Its ability to absorb wastes and destructive effluent is finite. Its ability to provide for growing number of people is finite. Mankind is fast approaching many of the earth's limits. Current economic practices cannot be continued without the risk that environmental systems be damaged beyond repair. Pressures from unrestrained population growth put demands on the natural system that can overwhelm any effort to achieve a sustainable future.

In the same vein Nardhaus (1992), argues that as the absolute size of human requirement for food, energy, materials or waste generation increase, they become larger and larger in relation to the finite size of the resources available to satisfy them. In this respect, the fact that it has always been possible to satisfy them in the past does not imply that they can be satisfied in future.

The implication of this line of thought is that exponential growth of both population and output has to be brought to an end. In fact, Rasmuson and Zetterstrom (2000), argue that unless both are brought to an end in the near future, there will not just be a forced halt to the growth of population and output but to a sharp collapse of both. This is because population and output would have reached levels, which are no longer sustainable and by so doing, will be plunged to very low levels.

Evidently, their findings explain to a large extent the relationships among demography, poverty and environment in urban South-West Nigeria.

Olaniyan (1997), confirms that the rapid expansion of the urban South-West Nigeria has been traced to the period of the rapid national economic expansion due essentially to the oil boom. Unfortunately, the expansion was lopsided favouring rapid urban growth to the detriment of the development of the rural areas. The consequence was a massive rural-urban migration whose socio-economic magnitude was too enormous for the facilities and available job opportunities in urban areas to cope with. By so doing, a large number of the rural-urban immigrants were forced into poverty from the beginning due to inadequate and non-functional infrastructure as well as structural unemployment.

One study that devotes attention on water balance to form the basis for understanding the fundamental processes of the varied geometries and composition of urban centre fabric especially in Africa is Oyebande (1990). He shows how the peculiarities of urban environment and the changes they induced in water cycles affect the environment, water resources and the water cycle in general.

He shows that changes induced in the pre-urban landscapes often make urban environment vulnerable to pollution and drainage/flood hazards. He avers that although the priorities of African urban development are for food, drinking water, shelter, clothing, sanitation, health and education, but as urbanisation intensifies, it usually becomes obvious that the attainment of these priorities are closely linked to water quality and storm water drainage.

By so doing, he identifies the principal factors of changes in the hydrological process of African urban areas as covering of parts of the

urban catchments with impervious surfaces and compaction of the remaining non-paved surfaces, leading to considerable environmental degradation. This finding is employed to identify environmental indicator in this study.

In trying to address sustainability concerns, Golding and Roland – Hoist (1994), identify water as a distinctive factor that constitutes direct input into almost all economic activities from agriculture, through manufacturing to myriad of service sectors. Furthermore, despite its long history of economic importance, water allocation stands out as one of the most significant cases of market failure in the developed and developing countries. In the same vein, its relative abundance and regenerative nature combined with population growth and rising living standard have hastened inefficient water use. In this respect, Golding and Roland-Hoist (1994), draw on Morocco in North Africa to illustrate the linkages between trade, macroeconomic policies and sustainable resource use and economic development.

Similarly, in Morocco, the institutional arrangements, which have governed water allocation, have fostered serious resource misallocation, choice of technology that is very inefficient and an array of negative economic and environmental externalities, which permeates the whole of the economy.

Using the Computational General Equilibrium (CGE) technique, they discovered that Morocco faces serious water resources constraints and the continuation of current water use practices threatens to sharply stagnate the development process.

In this respect, the CGE technique is used to affirm that a more sustainable approach to development requires that an appropriate mechanism for water production and allocation be introduced. This is done by evaluating the direct and indirect economic policies of water use, changes in water pricing and trade reforms. The result shows that there is considerable

scope for substitution between water and other factors of production and that economic incentive to promote this resource substitution can change Moroccan resource use pattern decisively towards a more sustainable path of economic development.

The CGE results also suggest that agricultural water use, which constitutes 92 percent of Morocco's total use, could be reduced by more than 33 percent if rural water prices were doubled. Such a policy will secure a more sustainable basis for future income growth even though it would reduce medium-term real rural income and GDP.

Moreover, the CGE results shows that if water price reforms is undertaken in concert with more comprehensive trade reform, the medium-term effect on income would be offset, with aggregate real income rising substantially while still achieving substantial water savings. Thus, the combined policies move the economy at once into prosperity and sustainability.

In conclusion, it is affirmed that a combination of economy-wide and sectoral policies are necessary to secure a sustainable basis for Moroccan future and that piecemeal approaches are unlikely to achieve the objectives of static efficiency and dynamic sustainability. The potential efficiency gains and resource savings of Moroccans from integrated, economy-wide policy reform are substantial. Although short-term adjustments may be painful, the prospect for necessary medium-term real income that facilitate sustainably high future real growth is very bright.

Much of the discourse on urban environment and sustainable development in Nigeria are based on explicit consideration of the various environmental factors on which the process of development rests.

In this respect, studies on the environment especially in urban Nigeria are often targeted at tackling the problem of excessive high population growth and the accompanying pressure on available space and resources.

Secondly, it is also targeted at seeking solution to the problems of pollution of surface and ground water systems as a result of indiscriminate disposal of solid and liquid waste. This in a way is to highlight the socio-economic consequence of these negative environmental trends.

The work of Fisher (1981), seeks to put the concept of sustainable development in an operation context by breaking it into components and identify policies and policy involvements required to achieve each components based on UNDP experience.

The first component is the global physical environment while each country has its own peculiar ecology. This ecology is part of the global ecological system. By so doing, a State is accountable for the impact of its actions on the global environment.

Second, is the country level context of sustainable development which is defined in terms of certain nationally determined measure of change, which improves the level of living without destroying or reducing the capacity to maintain this level for the foreseeable future.

The measures of change are inherent in the cultural, economic, physical and social dimensions of the society and are limited by available resources and available technology employed to harness the resources. In this respect, it argues that the traditional systems of management of resources especially renewable resources provide a basis for sustainable management of a country's resources.

One major counter argument against the use of traditional system of management of renewable resources is Lutz and Munasinghe (1993). The argument is based on the premise that renewability depends in several ways on the ability to provide the conditions necessary for reproduction, which may not be adequate in the traditional system. This discourse implies that the management of renewable resources require sound knowledge of how to use them to sustain ecological well-being and avoid patterns of management that have been characterised by severe environmental damage.

In a similarly powerful discourse, Aruezen and Gilbert (2003) supporting the non traditional system of renewable resource management affirms that the expansion of Efon Alaye town in Ekiti State to cover previously forested steep hill sides and intervening urban spaces have led to an increase in impervious cover ratio and subsequent generation of massive runoff and associated erosion.

Similarly it attributed urban growth and bad sewage management to the decline in environmental measures taken on Lagos Lagoon, given that an average 24,000 tons of suspended solids and 1,700 tons of biodegradable substances are discharged into the lagoon annually.

One study that is directed at the problem of pollution in Nigeria's urban settlement is Onakerhoraye (1995). He identified the nature of wastes produced in urban Nigeria as containing oil, grease and heavy metals with high concentration of caustic chemicals.

He identified the two major problems associated with improper disposal of industrial wastes as the health hazards to the urban inhabitants as well as its deleterious effect on the ecology.

One high point of his findings is that high level of industrial discharges does have a net upsetting effect on ecological balance of nature.

The work of George (2000), does consider the classification of Nigerian urban wastes from a different perspective. It classified urban wastes as comprising essentially a complex mixture of biodegradable and non-biodegradable substances with varying composition depending on the culture and the way of life of the urban people.

In spite of different approach to classification, the consensus is that urban Nigeria has virtually made no headway in the area of waste management and that no city in Nigeria can boast of a functional sewage system.

In fact, in the coastal cities, raw sewage is discharged into lakes, estuaries, lagoons, and other coastal waters. Although modern dwellings discharge sewage into concrete septic tanks, the porous nature of the walls of the tanks is such that microbial contamination of the surrounding soils and the shallow subsurface ground water takes place.

Second is that industrial effluent constitutes the next major pollutant of the atmosphere, surface and groundwater next to solid wastes.

Indeed, the phenomenon of exponential growth of environmental degradation arising from the neglect of environmental maintenance in national account can no doubt make the past a very poor guide to future environmental problems especially in view of the earth's limited capability to absorb and clean wastes generated from human production and consumption activities.

In spite of these concerns, however, there is a large and influential body of opinion, which maintains that future growth in per-capita output is sustainable. This is the view of the UNDP (1996), World Bank (1997).

Obviously, these studies do not deny the fact that if present trends are to continue unchanged, there will be increasing severe environmental problems especially in developing countries like Nigeria. This is because rapidly growing population would be putting excessive pressure on resources. However, they argue that there are ways of dealing with these problems while keeping per-capita income growing. In fact, further growth of income makes it more likely that these problems can be tackled successfully as they have been tackled to some extent in developed countries.

Thus, government policies, which facilitate growth, are vital to Sustainable Development. Increasingly, government would have to react to higher level of environmental degradation and overcome trans-border externalities, which are associated with economic behaviour.

2.6 Antecedents of Sustainable Development in Urban South- West Nigeria.

2.6.1 Historical Development

Sustainable development is usually considered to be the process by which society meets the needs and aspirations of its people using its human and material resource endowment without compromising the productive capacity of available resources for future use.

Many years back, level of development was measured by growth in per-capita income. Indeed per-capita growth had been variously considered as sufficient condition for development relying on the trickle down effect of growth to reduce income inequality.

In the pursuance of the growth objective, Nigeria made considerable structural transformation of its economy, seeking to shift from agriculture to industrialisation and services and from impersonal form of business organisation and small incorporate firms to large business organisations.

Furthermore, it sought to increase the quality of capital per head of population and capita-output ratio through external borrowing in view of the low propensity to save at home and low foreign exchange generation capacity.

In spite of these, economic growth failed to increase the general welfare of the people, reduce poverty and ensure self-reliance. Above all, it failed to prevent growing environmental degradation and ecological disturbances, especially in the highly urbanised areas of the country.

Nigeria's economic crisis arises from deteriorating balance of trade, rise in international interest rate, balance of payment disequilibrium, heavy debt burden, and widespread domestic distortion in production and increasing disparity in income distribution (Aromolaran, 1998).

Arguably, Nigeria was easily overwhelmed because of the dualistic nature of its economy with majority of the people engaging in subsistence agriculture and informal trading while industries and mining are firmly under the control of transnational companies.

Industrial productions are few and are consumption based for urban dwellers. Economic activities like energy and minerals are for export and are dependent on the transnational companies, which import the required physical, human and financial capital.

Furthermore, Nigeria urban economy is characterised by high structural weaknesses and relationship disarticulation between the subsistence

sector and the few modern sectors. This disarticulation is aggravated by poor physical, human and financial capital. Weak institutions, weak market and market creation capability, poor infrastructure and functional linkages among various sectors of the economy also aggravated the problem.

Unfortunately, Nigeria urban population was growing at a very high rate resulting in high proportion of its meagre resources being consumed, leaving few resources for capital formation.

The overall effects of these were the increasing pressure on land and forest, widening income inequality, rural-urban migration, environmental degradation and ecological disturbance especially in the urban areas.

2.6.2 The Brandt Report

In the same vein, development crisis has reached critical dimension in other Less Developed Countries (LDC) especially in Africa, leading to the setting up of an "Independent Commission on International Development Issues" (ICIDI) (The Brandt Commission) by the United Nations in 1979. It published its first report "*North-South: A Programme for Survival*" in 1980 and a second report "*Common Crisis*" in 1983 when the intensity and extensity of the debt crisis had worsened.

In fact, the extent of the crisis in Africa with respect to human development is shown in Table 2.1. It shows that in spite of the low level of human development, Africa's urban population continues to grow to the detriment of its development and perhaps worsening the crisis in the process.

Table 2.1: Human Development Ranking and Percentage of Urban Population of African Countries.

S/N	Country	Ranking	Urban population (% of Total Population)			
			1975		2002	2015
1.	Seychelles	35	33.3		49.8	53.3
2.	Libya	58	60.9		86	80
3.	Mauritius	64	43.4		43.1	47.3
4.	Tunisia	92	49.9		63.4	68.1
5.	Algeria	108	40.3		58.3	65.3
6.	Equatorial Guinea	109	27.1		47.1	58.2
7.	South Africa	119	48.0		56.5	62.7
8.	Egypt	120	43.5		42.1	44.9
9.	Gabon	122	40.0		83.1	89.1
10.	Sao Tome & Principe	123	27.3		37.7	40.3
11.	Morocco	125	37.8		56.8	64.8
12.	Namibia	126	20.6		31.9	39.8
13.	Botswana	128	12.8		51.1	57.5
14.	Ghana	131	30.1		45.0	51.1
15.	Comoros	136	21.2		34.4	43
16.	Swaziland	137	14.0		23.4	27
17.	Sudan	139	18.9		38	49.3
18.	Cameroon	141	26.9		50.6	59.9
19.	Togo	143	16.3		34.5	43.3
20.	Congo	144	N/A		N/A	N/A
21.	Lesotho	145	10.8		17.8	21.0
22.	Uganda	146	8.3		12.2	14.2
23.	Zimbabwe	147	19.6		34.5	41.4
24.	Kenya	148	12.9		38.2	51.8
25.	Madagascar	150	16.4		26.3	30.7
26.	Nigeria	151	33.4		45.9	55.5
27.	Mauritania	152	20.3		60.5	73.9
28.	Djibouti	154	61.6		83.3	87.6

S/N	Country	Ranking	Urban population (% of Total Population)			
			1975		2002	2015
29.	Gambia	155	17.0		26.1	27.8
30.	Eritrea	156	12.7		19.5	26.5
31	Senegal	157	34.2		48.9	57.9
32.	Rwanda	159	4.0		16.6	40.5
33.	Guinea	160	16.3		34.2	44.2
34.	Tanzania	162	10.1		34.4	46.8
35.	Cote d'Ivoire	163	32.1		44.4	51
36.	Zambia	164	34.8		35.4	40.8
37.	Malawi	165	7.7		15.9	22.2
38	Angola	166	17.4		34.9	44.9
39.	Chad	167	15.6		24.5	31.1
40.	Congo Dem. Rep.	168	29.5		31.2	39.7
41.	Central African Rep.	169	33.7		42.2	50.3
42.	Ethiopia	170	9.5		15.4	19.8
43.	Mozambique	171	8.7		34.5	48.5
44.	Guinea Bissau	172	16.0		33.2	43.5
45.	Burundi	173	3.2		9.6	14.6
46.	Mali	174	16.2		31.6	40.9
47.	Burkina Faso	175	6.3		17.4	23.2
48.	Niger Rep.	176	10.6		21.6	29.7
49.	Sierra Leone	177	21.4		38.1	47.6

Source: World Bank 2004. World Development Indicator 2004

Reinforcing the urgency of a people- oriented (Basic Needs Paradigm) development strategy, the Brandt's report emphasised that *"the hope that faster economic growth in developing countries by itself would benefit the broad masses of the poor has not been fulfilled"*. It went to assert that *"no*

concept of development can be accepted which continues to condemn hundred of millions of people to starvation and despair". It concluded by asserting that "statistical measurement of growth excludes the crucial element of social welfare, and values not measurable by money. Development is more than a passage from poor to rich or from a traditional rural economy to a sophisticated urban one. It carries with it not only the idea of economic betterment but also a greater human dignity, security and equity."

The Brandt's strategy was designed to redirect and revive the world economy by transferring resources from the developed countries to the developing ones like Nigeria and redirect energies in the developing countries toward elimination of corruption and over-ambitious development plans.

Unfortunately, the international community made little response to the Brandt's report apparently because its concept of expanding the economy of the South to prevent stagnation of the economy of the North did not impress the world at a time when the governments of the North, banks and people are benefiting from the flow of interest repayments and low commodity and energy prices from the South. (Baymol, 1986).

2.6.3 The Brandtland Report

The Brandtland report gave prominence to the phrase "sustainable development", published by the World Commission on Environment and Development (WCED) in 1987, the report captioned "**our common future**" gave the greatest insight into the relationship among equity, development and the environment.

The report was based on the United Nations General Assembly decision to commission the WCED to "propose long-term environmental strategies for achieving Sustainable development by the year 2000 and beyond.

With the specific objectives of:

- a) Re-examining the critical environmental and development issues and to formulate realistic proposals for dealing with them.
- b) Proposing new forms of international cooperation on these issues that will influence policies and events in the direction of needed changes.
- c) Raising the level of understanding and commitment to actions of individuals, voluntary organisations, businesses, institutes and government.

In executing its assignment, the WCED considered the problem from the fact that "many development trends leave increasing number of people poor and vulnerable, while at the same time degrade the environment. Can such development serve next century's world twice as many people relying on the same environment?"

It emphasised that many pattern of development erode the environment and the environmental resources on which they are based. By so doing, it inevitably degrades the resources that provide the development not only for the present generation, but also for the future ones. For example, green-house gases emission continues to increase in many African countries in spite of low level of development (Table 2.2)

Table 2.2: Human Development Ranking and Green – House Gas Emission By African countries.

S/N	Country	HDI Ranking	Carbon dioxide emission – per (capita metric tons)	
			1980	2000
1.	Seychelles	35	1.5	2.8
2.	Libya	58	8.8	10.9
3.	Mauritius	64	0.6	2.4
4.	Tunisia	92	1.5	1.9
5.	Algeria	108	3.5	2.9
6.	Equatorial Guinea	109	0.3	0.4
7.	South Africa	119	7.7	7.4
8.	Egypt	120	1.1	2.2
9.	Gabon	122	8.9	2.8
10.	Sao tome & Principe	123	0.5	0.6
11.	Morocco	125	0.8	1.3
12.	Namibia	126	0.2	1.0
13.	Botswana	128	1.1	2.3
14.	Ghana	131	0.2	0.3
15.	Comoros	136	0.1	0.1
16.	Swaziland	137	0.8	0.4
17.	Sudan	139	0.2	0.2
18.	Cameroon	141	0.4	0.4
19.	Togo	143	0.2	0.4
20.	Congo	144	0.2	0.5
21.	Lesotho	145	N/A	N/A
22.	Uganda	146	0.1	1.2

S/N	Country	HDI Ranking	Carbon dioxide emission – per (capita metric tons)	
			1980	2000
23.	Zimbabwe	147	1.3	0.3
24.	Kenya	148	0.4	0.1
25.	Madagascar	150	0.2	0.3
26.	Nigeria	151	0.1	1.2
27.	Mauritania	152	0.4	0.6
28.	Djibouti	154	1.0	0.2
29.	Gambia	155	0.2	0.1
30.	Eritrea	156	0.1	0.4
31.	Senegal	157	0.5	0.1
32.	Rwanda	159	0.1	0.2
33.	Guinea	160	0.2	0.3
34.	Benin Republic	161	0.1	0.1
35.	Tanzania	162	0.1	0.7
36.	Cote d'Ivoire	163	0.6	0.2
37.	Zambia	164	0.6	0.1
38.	Malawi	165	0.1	0.5
39.	Angola	166	0.8	N/A
40.	Chad	167	N/A	0.1
41.	Congo Dem. Republic	168	0.1	0.1
42.	Central Africa Republic	169	N/A	0.1
43.	Ethiopia	170	N/A	0.1
44.	Mozambique	171	0.3	0.2
45.	Guinea Bissau	172	0.7	N/A

S/N	Country	HDI Ranking	Carbon dioxide emission – per (capita metric tons)	
			1980	2000
46.	Burundi	173	N/A	0.1
47.	Mali	174	0.1	0.1
48.	Burkina Faso	175	0.1	0.1
49.	Niger Republic	176	0.1	0.1
50.	Sierra Leone	177	0.2	

Source: World Bank 2004. World Development Indicator 2004.

The Brandtland report concluded that for development to be sustainable, it must “meet the needs of the present generation without compromising the ability of future generations to meet their needs” (Intergenerational Equity).

It specified the following objectives for national development and environmental policies if Sustainable development must be realised

- (a) Reviving growth;
- (b) Changing the quality of growth (Intragenerational equity);
- (c) Meeting basic needs for food, water, energy, sanitation and jobs;
- (d) Ensuring a sustainable level of population;
- (e) Conserving and enhancing the resource base;
- (f) Re-orientating technology;
- (g) Merging environment and economics in decision-making

2.6.4 The United Nations Conference on Environment and Development (Rio 1992)

The conference was meant to consolidate the Brandtland report of 1987 and consider how its recommendations could be implemented. This conference became an avenue where strategies to fully integrate the

relationship between the environment and development into every facets of national economic life was decided.

Earlier before the Rio Conference, developing countries including Nigeria regarded environmental protection issues as added cost, which has to wait until a later stage in their development process. The Rio Conference made many developing countries to realise that environmental protection is a catalyst to development if tackled at an early stage.

In Rio, four basic issues were tackled. They are: -

- a) The framework describing in broad terms the challenges and actions to be taken by States to protect the environment;
- b) Treaties on climate change and biodiversity;
- c) An agreed programme of work by international communities addressing major environmental and development priorities;
- d) Broad statements on forest principles.

At the end, the summit proved to be a bold attempt by mankind to ensure the realisation of sustainable development within a short period. Since the World Commission on Environment and Development (Brandtland) report of 1987 and the subsequent summit of the United Nations, the Nigerian government appeared to have realised that environmental goals need not be in conflict with economic and social development because economic development can be compatible with environmental conservation. For example, in spite of the growing green-house gases emission in Nigeria (Table 2.2), infant mortality rate reduced from 120 per thousand in 1970 to 110 per thousand in 2002. Similarly, life expectancy at birth increased from 44 years in the period between 1970 and 1975 to 51.5 years between 2000 to 2005 (Table 2.3). Moreover in spite of increase in carbon dioxide emission, energy required to power GDP declined between 1980 and 2000 (Table 2.4).

In other words, urban environmental management can provide a basis for sustainable economic and social development in the urban areas. Hence, the present problems of urban environmental degradation need not arise within the framework of Sustainable Development.

Table 2.3: Nigeria: Social and Economic Indicators

S/N	Social and Economic Indicators	Measurement values
1.	Life expectancy at birth (HDI), 2002	51.6
2.	Adult literacy rate (% ages 15 and above) (HDI), 2002	66.8
3.	Combined gross enrolment ratio for primary, secondary and tertiary schools (%), 2001/02	45
4.	GDP per-capita (PPP US\$) (HDI), 2002	860
5.	Probability at birth of not surviving to age 40 (% of cohort), 2000-05	34.9
6.	Adult illiteracy rate (% ages 15 and above), 2002	33.2
7.	Population without sustainable access to an improved water source (%), 2000	38
8.	Population living below \$1 a day (%), 1990-2002	70.2
9.	Population living below \$2 a day (%), 1990-2002	90.8
10.	Public health expenditure (% of GDP), 2001	0.8
11.	Private health expenditure (% of GDP), 2001	2.6
12.	Births attended by skilled health personnel (%), 1995-2002	42
13.	Physicians (per 100,000 people), 1990-2003	27
14.	Population with sustainable access to improved sanitation (%), 1990	53
15.	Population with sustainable access to improved sanitation (%), 2002	54
16.	Population with sustainable access to improved water source (%), 2002	62
17.	Children underweight for age (% under age 5), 1995-2002	36

S/N	Social and Economic Indicators	Measurement values
18.	Children under height for age (% under age 5), 1995-2002	43
19.	Infant with low birthweight (%), 1998-2002	12
20.	Tuberculosis cases (per 100,000 people), 2002	565
21.	Life expectancy at birth (years), 1970-75	44.0
22.	Life expectancy at birth (years), 2000-05	51.5
23.	Infant mortality rate (per 1,000 live births), 1970	120
24.	Infant mortality rate (per 1,000 live births), 2002	110
25.	Under-five mortality rate (per 1,000 live births), 2002	183
26.	Probability at birth of surviving to age 65, female (% of cohort), 200-05	44.5
27.	Probability at birth of surviving to age 65, male (% of cohort), 2000-05	42.0
28.	Telephone mainlines (per 1,000 people), 1990	3
29.	Telephone mainlines (per 1,000 people), 2002	5
30.	Cellular subscribers (per 1,000 people), 1990	0
31.	Cellular subscribers (per 1,000 people), 2002	13
32.	Internet users (per 1,000 people), 1990	0
33.	Internet users (per 1,000 people), 2002	3.5
34.	Researchers in R&D (per million people), 1990-2001	15
35.	GDP (US\$ billions), 2002	43.5
36.	GDP (PPP US\$ billions), 2002	113.6
37.	GDP per-capita (US \$), 2002	328
38.	GDP per-capita annual growth rate (%), 1975-2002	-0.6
39.	GDP per-capita annual growth rate (%), 1990-2002	-0.3
40.	Average annual change in consumer price index (%), 1990-2002	27.8
41.	Average annual change in consumer price index (%), 2001-02	12.9

Source: United Nation Development Programme. Human Development Reports 2003.

Table 2.4: Nigeria: Indicators of Energy and the Environment

S/N	Energy and Environment indicators	Measurement values
1.	Traditional fuel consumption (% of total energy requirements), 2001	82.3
2.	Electricity consumption per-capita (Kilowatt-hours), 1980	108
3.	Electricity consumption per-capita (Kilowatt-hours), 2001	154
4.	GDP per unit of energy use (1995 PPP US\$ per kg of oil equivalent), 1980	1.3
5.	GDP per unit of energy use (1995 PPP US\$ per kg of oil equivalent), 2001	1.1
6.	Carbon dioxide emissions – per-capita (metric tons), 1980	1.0
7.	Carbon dioxide emissions – per-capita (metric tons), 2000	0.3
8.	Carbon dioxide emissions – Share of world total (%), 2000	0.1

Source: United Nation Development Programme. Human Development Reports (2003)

Furthermore, it was believed that the failure to halt further deterioration of urban environmental quality might jeopardise the health of a large segment of the urban population with serious political and socioeconomic implications.

In the light of these and others, the federal government established the Federal Environmental Protection Agency (FEPA) by Decree 58 of 30th December 1989 with the statutory responsibility for overall protection of the environment.

In November 1989, the National Policy on the Environment was launched. The goal of the policy is to achieve sustainable development in Nigeria by securing for all Nigerians a quality of environment adequate for their health

and well-being and to conserve and use the environment and natural resources for the benefit of the present and future generations.

In this respect, the National Policy on the environment provides that management of wastes be done with the understanding of range of treatments, disposal and re-use options available for sanitary and industrial effluents, and raw domestic wastes. This is to ensure that improper handling and disposal of wastes do not lead to the spread of diseases and the pollution of land, air and water.

These objectives are to be realised through the:

- (i) The specifications of waste disposal sites that guarantee the safety of surface and underground water system.
- (ii) Setting up and enforcement of standards for adequate sanitary facilities for the disposal of human and other solid wastes in dwellings, housing estates and public facilities in the urban areas.
- (iii) Periodic surveillance of approved wastes disposal sites
- (iv) Early warning system for the identification of waste disposal hazard.

But unfortunately the expression is not translated into palpable implementation in urban South-West Nigeria.

Secondly, it considers the atmosphere as being very vital to the survival of the people. To this end, the policy made strategies to realise a clean atmosphere through among others:

- i. Control of point and non point sources of pollution.
- ii. Provision of standards for factories and other activities, which emit pollutants.
- iii. Licensing and registering of all major industrial air polluters and monitoring their compliance with laid down standards.
- iv. Provision of guidelines for abatement of pollution.

- v. Prescribing stringent standards for the level of emission from automobile exhausts and energy generating plants.
- vi. Setting up standards to minimise the occurrence of acid rains.
- vii. Prescribe guidelines for control of construction sites, market and meeting places.

Interestingly, the policy did not explicitly formulate strategy to combat urban flood. It expects, however, to bring about the "development and implementation of a phased and systematic programme for the enhancement of the aesthetic appeal and living condition in the cities through tree planting and related anti-erosion landscape management measures.

Moreover, the National Policy emphasises the need to sustain the productivity of natural vegetation, protecting wildlife, maintaining bio-diversity and avoid forest and soil destruction.

- i) The strategies used to achieve these objectives are among others:
- ii) The promotion of rational exploitation of forest resources to meet domestic consumption needs.
- iii) Regulating forestry activities to enhance conservation and environmentally sound management practices.
- iv) Strengthening forest protection programmes to ensure adequate vegetation cover.
- v) Protecting flora and fauna in danger of extinction
- vi) Encourage reforestation and afforestation.

It is obvious that the policy recognises the need to ensure the survival of maximum number of species in the ecosystem.

It also provides that planned and rationale use of space in the development of human settlements and the re-invigoration of existing cities is a desirable

national goal. For this purpose, it makes it essential to provide appropriate infrastructure and services for the protection of human health and environment. The policy is to be implemented through:

- i. Provision of guidelines for the establishment and maintenance of recreational spaces.
- ii. Maintenance of an appropriate balance in the allocation of land including the curtailment of urban sprawl on prime agricultural land.
- iii. Initiation of urban renewal plans and measures.
- iv. Provision of guidelines for environmentally sound Master Plans for urban development.
- v. Produce and implement plans for the development of model cities and villages.

But in spite of this policy, the problems of urban blight continue to be entrenched in the region's urban areas.

2.6.5 Policy and Programme to Retard the Rate of Urbanisation in South-West Nigeria

In order to achieve the objectives of the National Policy on the environment, the policy calls for actions to raise public awareness and to encourage individual and community participation in environmental improvement. Unfortunately, it did not consider the factors of population, population density and settlements as important for the attainment of Sustainable development. Interestingly, the South-West of Nigeria continues to remain the most urbanised region of Nigeria since independence (Table 2.5)

Table 2.5 Distribution of Urban Population In Nigeria (1991)

Geo-political Regions	Urban population
North-East	2,569,832
North-Central	3,360,278
North-West	6,117,493
South-South	3,965,787
South-East	3,942,334
South-West	11,525,856

Source: National Population Commission Census (1991).

In 1959, in order to halt the momentum of urbanisation prevailing towards the time of independence and beyond, the government of South-West Nigeria introduced the policy of restricting the geographical mobility of people to the urban areas.

The thrust of this policy was the farm settlement scheme (Mabogunje, 1981). Its objectives were to keep young, able-bodied men and secondary schools' graduates in agriculture. It was also meant to increase agricultural production and enhance food self-sufficiency.

The scheme involved the building of rural houses, which were equipped to an urban standard with electricity, water supply and other facilities. Also, farmlands were allocated on the basis of derivable income and were made comparable to the cities while modern farming machinery was provided. Some of the settlements were located in Ikorodu and Ifo local government areas of Lagos and Ogun States respectively.

This policy was based on the push-pull theory of migration in which certain factors like the labourious nature of agriculture, lack of basic amenities and

low income are said to push the migrants to the city while the expectation of high income and availability of basic amenities pull the migrants further.

The farm settlements scheme was a success to a certain extent until the oil boom of the seventies attracted a lot of the scheme participants into other occupations in the urban areas and made the scheme failed. Various reasons were adduced for the failure of the scheme, parts of which include the wrong choice of settlers, overcapitalisation, exaggerated rate of return and administrative difficulty (Mabogunje, 1981).

From 1974, the Federal Government introduced a number of agricultural programmes to halt rural-urban drift and from which the South-West region benefited.

The first of these, the National Accelerated Food Production Programme (NAFPP), sought to increase the production of Nigerian staple foods like maize, rice, guinea corn, millet, cassava and cowpea through government subsidy on fertilizer and hiring of machineries to farmers.

Its objectives are to enhance farmers' income and make it comparable to the average income in the urban areas.

Furthermore, the Nigerian Agricultural Bank was established in 1974 to provide credit facilities and technical assistance to farmers.

In spite of all these, by 1976, it was discovered that the Programme has failed because of lack of adequate clear-cut objectives, poor commitment by the federal government and inadequate transport facilities. Furthermore, most farmers lack of good storage facilities coupled with low market prices of agricultural commodities due to competition from imported agricultural products (Akolade 1996). Operation Feed the Nation (O.F.N) was later launched in 1976 to engender public interest in agriculture and arrest urban

drift through its call for people to return to the farm. The O.F.N also failed because it lacked institutional arrangement to ensure its operation.

The Green Revolution Programme was launched in 1980 to provide solution to the worsening food situation accentuated by rapidly growing urbanisation and the failures of past agricultural development programmes. Its implementation focused on the use of large scale farming approach, improvement on the efficiency of small-scale farmers, use of bilateral scheme approach with the World Bank and the River Basin Development Projects.

South-West farmers benefited from all the projects of the Green Revolution Programme including the River Basin development projects. But these did not do much to halt the growing momentum of urbanisation in the region.

Undaunted however, some State Governments such as Lagos State introduced the Graduate Farmers Scheme in 1986 to stem the possible socio-economic agitation in the urban areas of the region due to the alarming increase in the rate of graduate unemployment as well as to solve the perennial food shortages.

Similarly, the School Agricultural Programme was launched in 1988 by some States such as Lagos and Ogun to enhance the teaching and practice of agriculture in secondary schools, stimulate food production and discourage future drift to urban areas. Unfortunately, only a few of the projects are still viable today for want of commitment from its custodian (Akolade, 1996).

The concept of Agricultural Development Project (ADP) began in Nigeria in 1972 with the launching of the World Bank Assisted Rural Development

Schemes in Funtua, Gusau and Gombe in Northern Nigeria, it later spread to the South-West of Nigeria. Its overall objectives were to:

- (a) Increase farm income, crops, and livestock and fisheries production and consequently improve the welfare of farmers and fishermen in the region;
- (b) Introduce a re-organised extension system on farmers and fishermen through diffusion of recommended practices for food crops, livestock and fisheries;
- (c) Establish an effective linkage between research, extension and the farmers and fishermen of the region;
- (d) Operate agricultural input distribution system;
- (e) Provide consulting services and demonstration plots for improved small-scale storage and processing techniques for the major crops of the region;
- (f) Halt the urban drift that was becoming alarming at the time in the region.

In spite of these policies and programmes, the region has not been successful in keeping the large number of its young able-bodied men and women busy in rural areas for agricultural and rural development and the enhancement of environmental quality in the urban areas.

2.7 Indicators of Sustainable Development

The indicators of sustainable development through adjustment of the system of National Account have been widely debated in literature. Important references include Ahmad (1989); Hartwick (1991) and Oshuntokun (1998).

Hartwick (1991), proposed the condition for achieving intra and inter-generational consumption through time. He emphasizes that so long as the stock of capital does not decline over time, non-declining consumption is

possible; and stated that the "stock of capital could be held constant by reinvesting all rents from non-renewable resource extraction in man-made capital".

This was adjusted by Pearce and Wartford (2003), in view of the objection to direct reinvestment of all rents in man-made capital. Such objection arises from the limited degree of substitutability between natural capital and man-made capital and the need to maintain some amount of natural capital stock for future generation through preventing reduction in the level of natural capital below some constraint level.

The safe minimum standard developed by Hawksworth (1994), implies that environmental resources are not allowed to fall below some safe minimum standard unless where the opportunity cost of maintaining the standard is reasonably high.

It originates from decision-making under uncertainty because society is usually unsure about future cost of current environmental degradation especially when one is unsure of environmental consequences of the action of use.

The work of Daly (1990), identified operational principles for sustainable development by setting all harvest levels at less than or equal to population growth rate. It establishes assimilative capacity for receiving ecosystem and divides receipt from non-renewable resources into an income stream and investment stream, while the investment stream is invested in renewable substitutes.

Arnold (1995), identifies vehicular emissions as a major source and indicator of atmospheric emission and air pollution. He avers that road transport is a major source of air pollution through emission of carbon monoxide, nitrogen oxides, volatile organic compounds, particulates carbon dioxide and lead. He concluded by generating data to aver that any

programme meant to control atmospheric pollution must address the problem of pollution from road transportation.

Basically, a major indicator of sustainable development is the environmental adjusted Net National Product (NNP) developed by Hartwick (1991).

The optimal adjustment to the Net National Product for non-renewable resources is based on the condition that rents of non-renewable natural resources extraction are deducted from the NNP.

For renewable resources, they differ from non-renewable in that positive growth can occur subject to population size and rate of harvesting because when harvest rate is less than growth rate, this adjustment adds to NNP and vice versa.

Hartwick (1991), modeled pollution as a stock, which exerts negative effects on production making Environmental National Product equal the National Product minus the change in the stock of pollution.

There is no denying that one of the major drawbacks for sustainable development in many countries especially in developing countries like Nigeria is the non-incorporation of depreciation of environmental resources into the system of National Account.

The concept and definition of income has been a subject of considerable debate in most literature dealing with environmental concerns.

From the perception of the widely accepted Hicksian concept, economic growth requires that income and consumption be expanded while maintenance cost is incurred in producing the income. In other words, if required maintenance is undertaken, income will not fall through time.

Population growth, however, necessitates investment expenditure sufficient to generate enough new income to at least keep per-capita income constant.

But the work of Maurice (2004), explained that in many Less Developed Countries, economic growth is being pursued at an unsustainable rate because the maintenance cost required to sustain income is only limited to capital maintenance without direct consideration for sustenance of environmental quality. It is in this regard that many forms of environmental degradation and deterioration are not properly considered.

In this regard, Desai (1997), notes that the use of natural resources is part of economic development. However, it poses developmental problem when the required investment derived from these resources and the maintenance required to overcome environmental degradation are not accounted for. By so doing, environmental maintenance costs are rising and shall continue to rise so long as population and output increase.

Dasgupta (1994), offers a means of incorporating the idea of sustainable development into the measurement of National income. By drawing on the work of welfare economists (Sen, 1982, Annand and Ravillon, 1993). Dasgupta (1994), asserts that there are currently two ways of assessing changes in well-being. One is to measure the value of changes in the constituents of well-being (utility and equity). This procedure measures the value of alteration in various outputs like the indices of health, education and other social indicators. The other procedure being to measure the value of the alteration in the goods and services that are inputs in the production of well-being – the real national income.

Dagusta (1994), key on the national income approach is that for any conception of aggregate well-being, there exist shadow prices for goods

and services that can be used in the estimation of national income. This estimation has an important property of reflecting an increase in aggregate well-being with every improvement in economic activities. Moreover, the use of national income as a measure of well-being persists no matter the basis upon which aggregate well-being is determined. In others, its use is not restricted to utilitarian economic parameter.

In view of this, Dagusta criticises the national income as a means of measuring well-being as being a measure of opulence and not well-being. He emphasises that the failure of the current estimates of Net National Product (NNP) to measure and deduct depreciation on environmental resources is a key pitfall of the National Accounting System. This is because it amounts to imputing the depreciation of environmental capital to zero. In this way, the use of National Account has failed to adequately priced environmental resources and by so doing, private profit attributed to activities that degrade the environment are higher than the social profit they generate. In this respect, investment and technological choices are biased since profit and national output would have been lower, if full account were taken of environmental depreciation.

As a panacea to the problem of distortion of the real value of the national income as a result of environmental degradation, Dagusta proposed an incorporation of environmental concern into the National Accounting system by adding the values of changes in the environmental resources base and investment in the stock of environmental defensive capital.

Furthermore, Dagusta defines the valuation of environmental accounting prices as the sum of the use and option values. The use value captures the value of environmental resources as input into the production of tradable goods and household production. The option value captures the shadow value of goods that arises as a result of the intrinsic worth of environmental

resources that may arise from possible uncertainty regarding the future use value of such resources. By so doing, it is said that the incorporation of use and option values to determine environmental prices will go a long way to enhance focus on issues of Sustainable development.

In this regard, Desai (1997), proposes an alternative objective function, which captures the notion of sustainability more directly. The objective function seeks the lower limit of future stream of income or utility in order to maximise it. The model allows the environment to regenerate itself provided the stock of environmental resources do not fall below some lower limit or rise above some maximum limit.

He also postulates that since the environment is used for production and for provision of utility benefit, its degradation affect the latter. By so doing, high rate of time discount lead to higher stock of environment in the steady states because lower rate of time discount lead to lower investment and capital stock and thus increase the requirement for environmental input in production.

In Nigeria, Osuntokun (1998), developed an indicator for sustainable development through his work on environmental accounting as a framework for macroeconomic and sectoral policies for developing countries.

He defined sustainable income, which he calls Sustainable Social Net National Product, as the maximum amount that can be consumed in a given period without reducing the amount of possible consumption in a future period. His major departure from earlier studies is his derivation of sustainable income or sustainable social net national product from two adjustments to the Net National Product namely; defensive expenditure and depreciation of national capital. He classified defensive expenditure as

the costs of all environmental damages, compensation, increased commuting, housing and recreation costs and cost associated with increased risks generated by the maturation of the industrial system.

But the most widely accepted indicator which is also germane to this study is the United Nations Commission on Sustainable Development (1996) work programme on indicators of sustainable development. It includes a list of indicators organised into the Driving force and State framework together with methodology to provide sufficient information about the concept, significance, measurement and data sources for each indicator.

It identifies driving force indicators as representing human activities, processes and patterns that impact on sustainable development and state indicators indicating the state of Sustainable development in a given society.

One of the empirical works on indicators of sustainable development and urbanisation in the Less Developed Countries is that of Holland (2004). He examines the effect of Structural Adjustment on urban poverty and sustainable development in Kingston Jamaica, its impact on macroeconomic strategies of consumption practices, the extent to which traditional cost of adjustment have impaired the social sector's ability to effect wealth creation and the extent to which changing employment practices represent a drive towards Sustainable development. The empirical result obtained showed that the macroeconomic imperative of compressing private consumption and shifting resources towards investment and growth under Structural Adjustment forced the sum of earned and non-earned income accruing to Jamaicans in Kingston to decline by 8.8% of the share of GDP between 1977 and 1987.

Similarly, cuts in social spending between 1980 and 1990 exacerbated the crises affecting the education and health sectors through deteriorating

quality of public stock, reduced availability of equipment and decreases in staff/pupil and personnel/patient ratio. Housing construction fell by 59% between 1983-1993. There is wide gap between minimum wage and the most basic level of sustenance. Finally, despite expansion in employment in the formal and informal sector, there is deterioration in the city's human resource base exacerbated by emigration, which ultimately creates an environment of economic unsustainability.

Other empirical work includes that of Reed (1996) whose study is into structural adjustment, the environment and sustainable development. He designs a model that identifies price and non-price factors, which determine responses to structural adjustment in Argentina.

He discovers that in the overall, structural adjustment has increased rate of environmental degradation by increasing input prices, reducing expenditure on reforestation and promoting economic unsustainability through market liberalisation. In addition, he also discovers that structural adjustment leads to unrelated sectoral policies in agricultural extension, poor enforcement of land clearing and inappropriate energy pricing resulting in poor incentive for environmental resources conservation and downward spiral of economic and environmental well-being.

He concludes that if the structural adjustment programme continues, deforestation and soil erosion would increase, resulting in poor water quality. Similarly, air pollution would rise and biodiversity would decrease although GDP will increase but with growing income disparity.

2.8 Theoretical Framework

The objective of sustainable development is to enhance the optimal level of interaction between the biological and resource system and the

economic system, through a process that would ensure that such optimal level could be supported by the systems.

In essence, sustainable development requires the maximisation of the net benefit of economic development subject to maintaining the services and quality of scarce natural resources. In this regard, the appropriate models for the realisation of sustainable development have been subjected to a thorough debate in literature.

2.8.1 Models of Natural Resources Scarcity

The model of natural resources scarcity has been well grounded in the work of the classical economists.

Their major contribution is the theory of absolute natural resources scarcity. Absolute natural resources scarcity arise from the hypothesis that in the exploitation of natural resources, diminishing returns do not set in until the absolute limits of the available stock of natural resources is reached. It does occur if an economic activity or a whole system of economic activity depends upon essential natural resources that have finite limits in its physical availability. As such, resources are being depleted in the economic process, it would become absolutely scarce in the physical sense and there would be little more of those resources to be used.

Babier (1989d), showed that the weakness of the absolute natural resources scarcity theory is its treatment of natural resources as being homogenous in quality.

He also shows that their contributions make no assumption of an absolute limit to the availability of natural resources. Here, natural resources scarcity is relative and diminishing returns requires no specification concerning the horizon. Consequently, declining quality of natural resources is said to be

the cause of natural resources scarcity and overwhelming demand for natural resources in spite of increased productivity. These would eventually increase demand in excess of supply leading to distributional impact on exchange relationship, private property institutions and pattern of income distribution.

Moreover, certain services provided by nature, such as solitude, meditation, natural beauty and pleasantness are threatened by the use of the environment for furthering economic growth. This conclusively shows that scarcity of environmentally essential services would have a detrimental impact on human welfare long before diminishing returns impose an absolute constraint on economic activity and without the scarcity being reflected in market prices of environmental natural resources.

Hotelling (2001), does considerable work on the model of depletion of exhaustive resources. He demonstrated that at optimum, the price of an exhaustive resource net extraction cost must be rising at a rate equal to the rate of interest on other assets. But as extraction cost falls, the net price (rent) rises, the market price for the resources would increase and quantity demanded would start to fall. At the optimal rate of depletion, the resources would be exhausted, the instant demand falls to zero and production falls to zero.

As a contribution to the work of Hotelling, the study of Pearce and Warford (2003), shows that natural resources depletion arises from the continuous dynamic interaction and that the complexity and heterogeneity of nature is the most significant feature determining the relationship between man and nature. By so doing, the Hotelling concept of separating exhaustible resources from others cannot achieve intergenerational equity.

They concluded that resource base must be viewed as a composite of renewable and exhaustible, limiting renewable resources within which that allows for steady substitution of renewable for non-renewable and technical progress over time especially if users are indifferent about which is used.

In a further development of the model, Bird (2004), explored the conditions under which exhaustion is optimal. These conditions are:

- a) When social discount rate is very high or the regenerative capacity of the resource is low. It would be better to exhaust the resources to a minimum stock level and reinvest the proceed in other assets where value is expected to increase much faster.
- b) When the harvesting cost is very low or the value of a harvested unit is very high, it would be economical to exhaust the resources to the minimum stock level.

However, these models have been criticised for avoiding the problem of uncertainty about the general environmental problems consequent to economic activities.

Finally, it is criticised for avoiding ecological uncertainty where the natural rate growth of natural resources varies at random (Aruetzen and Gilbert 2003).

Jeoren et.al. (2004), designed a dynamic macro model to provide an analytical framework for the study of the long term development of an economy in relation to its natural environment. Their approach is based on the reciprocal interactions between population growth, investment, allocation of input and output, technology and productivity on the one hand and declining environmental quality, pollution and resource exhaustion on

the other hand as well as inter-dependence between various environment effects using a material balance perspective of economic processes.

Defining material balance in terms of an equality or inequality condition that relates the total resource input to the output of produced goods and waste, they specifies production functions and materials accounting among phases of extraction, production, consumption, emission and recycling and concluded that permanent reduction in environmental quality makes it very difficult for an economy to sustain a positive trend or even a constant level of economic performance.

Barbier (1989a), attempts to model the optimal-growth paths for an economy faced with the choice of operating under three long-term biophysical constraints namely harvesting of renewable resources within their natural and managed rate of regeneration; extracting exhaustible resources at the rate at which renewable can be substituted for them (which, in the long run, implies a zero rate of exhaustion of the composite resource); and emitting wastes within the assimilative capacity of the environment.

The key to the model is the assumption that at any time t , the rate of environmental degradation S , is equal to any flow of waste emitted from the economic process W , in excess of the amount of waste assimilated by the environment A ; plus the flow of renewable resources harvested from the environment R , in excess of the natural productivity of these resources G ; plus the flow of exhaustible resources extracted from the environment E :

$$S = (W - A) + (R - G) + E, \quad \dots(2.14)$$

Where $(W - A) = 0$ if $W = A$

$(R + E) - G = 0$, if $(R + E) = G$.

Since resources are extracted and harvested and wastes are emitted by the economic process to provide consumption C , it is assumed that:

$$W = W(C), W'(C) > 0, W''(C) > 0 \quad \dots(2.15)$$

$$R = R(C), R'(C) > 0, R''(C) > 0$$

$$E = E(C), E'(C) > 0, E''(C) > 0.$$

In other words, it is assumed that environmental degradation is an increasing function of wastes emitted from the economic process. Consumption is an increasing function of environmental degradation.

Similarly, as the flow of wastes emitted from the economic process reaches critical threshold, the limit of assimilative capacity of the environment is reached allowing for unmitigated environmental degradation.

In the same vein, environmental degradation is an increasing function of the flow of renewable resources harvested from the environment.

As the flow of renewable resources harvested from the environment grows to critical threshold, the limit of natural productivity of these resources is reached resulting in unmitigated environmental degradation.

Finally, environmental degradation is an increasing function of the flow of exhaustive resources extracted from the environment.

As the flow of exhaustive resources extracted from the environment reaches critical threshold, unmitigated environmental degradation is enhanced.

Similarly, if X is some measure of environmental quality, then it is assumed that the amount of waste assimilated and the biological productivity of the environment are both increasing functions of X :

$$A = A(X), A'(X) > 0, A''(X) < 0 \quad \dots(2.16)$$

$$G = G(X), G'(X) > 0, G''(X) < 0$$

Substituting (2.2) and (2.3) into (2.1) yields:

$$\begin{aligned} S &= [W(C) + R(C) + E(C) - [A(X) + G(X)]] \quad \dots(2.17) \\ &= N(C) - Q(X) \end{aligned}$$

Where $N(C)$ indicates the increasing environmental degradation resulting from the various resource demands of the economic process and $Q(X)$ is the environmental resilience in the face of these resource demands.

Given (2.2), it is assumed that:

$$N(C) > 0, N'(C) > 0, N''(C) < 0, C > \underline{C} \quad \dots(2.18)$$

$$N(\underline{C}) = 0, C = \underline{C}$$

Where \underline{C} is the level of consumption where the economy is consuming accumulated resource stocks, with pollution abatement ensuring that $W = 0$. Hence, an economy at consumption level \underline{C} is making no additional resource demands on the environment.

Similarly, from (2.16) it is assumed that:

$$Q(X) > 0, Q'(X) > 0, Q''(X) < 0, X > \underline{X} \quad \dots(2.19)$$

$$Q(\underline{X}) = 0, X \leq \underline{X}$$

Where \underline{X} is the minimum sustainable level of environmental quality. That is, if environmental quality falls below \underline{X} , ecosystems are no longer capable of assimilating waste and generating biological productivity.

Finally, it is assumed that there is an inverse relationship between S and X ; i.e. if environmental degradation is increasing over time, then environmental quality must be falling:

$$X = -aS \quad \dots(2.20)$$

$$=a[Q(X)-N(C)].$$

Equations (2.14) and (2.20) reflect the criteria for sustainability, that of observing the biophysical constraints.

That is, a minimum condition for an economic growth path to be sustainable over the long run is $W = A$ and $(R + E) = G$. This means that the minimum condition for an economic growth path to be sustainable in the long run is realised when waste emitted equals the assimilative capacity of the environment and flow of renewable and exhaustible resources equal the rate of regeneration of renewable resources. This would ensure that no environmental degradation occurs. Thus, one possible choice open to society is to plan for a growth path that, in the long run, produces zero environmental degradation.

Conditions (2.14) and (2.20) also indicate, however, that as long as some environmental degradation continues to occur, environmental quality will decline.

Equation (2.19) suggests that there is a lower limit to environmental quality. If X is driven below \underline{X} , environmental degradation will have destroyed the natural clean-up and regenerative processes in the environment.

This is tantamount to an environmental collapse, and economic growth leading to such a collapse can be said to be environmentally unsustainable. Nevertheless, there may be conditions under which society may have no choice but opt for an unsustainable growth path.

Empirical work on natural resources scarcity includes that of Solo (1999). He examines the effect of Mexicans' community based property right system on sustainable resources management. The study was based on the age long terminal system which allows individuals the ownership of State land, once they can demonstrate long standing community based use of the surrounding resources in the face of general difficulty of land acquisition. He concludes that this system allows for sustainable management of resources as beneficiaries adopt practices, which are not only beneficial to land but conserve the natural resource base of the land.

Similarly Braadbaart and Braadbaart (1997), study the problem of groundwater over-exploitation in urban industrial areas of Indonesia. Their findings show that the groundwater tariff and quota system introduced in the 1980's to limit and discourage industrial pumping did not put a halt to industrial ground-water mining because private firms evaded tariffs and quotas on a large scale. Moreover, the tariff instrument lacked impact because the tariff was set at level too low to affect decisions of industrial pumpers.

They conclude that tariff instrument must be properly deployed to serve environmental goals, provide regulators with operational funds for enforcement and provide pumpers with incentives to economise on groundwater use.

2.8.2 Models of Pollution Control

The economic models of pollution control are built around the problem of externality separate to that of optimal exhaustible and renewable resource use.

The economic analysis of externalities has been well grounded in the work of Bartelmus (1996). The approach has been to consider the problem of pollution and other environmental degradation as one in which economic agents imposed external costs upon the society. With no prices to provide the incentives for reduction of polluting activities, the inevitable result is the excessive demand on the assimilative capacity of the environment.

These models treat externality as special types of public goods that are characterised by non-depletability and non-excludability. It results in the determination of a tax, called the Pigouvian tax that charges polluters an effluent fee that is equal to the marginal social damage produced by the polluters' activities.

In calculating the optimal level of the tax, Pigou (1962), emphasised the importance of weighing the benefits of reducing social damage against the additional abatement costs imposed on the polluters as they attempt to control the pollution. The point where it costs more to abate the pollution than what the pollution is worth in term of the social damage is the optimal level of pollution and Pigouvian tax should be set to equal marginal social damage at this point.

The Pigouvian tax has been criticised for making several implicit assumptions (Bowers, 1997). They are that the pollution transaction is unambiguous and is well defined in time and space with the polluters and sufferers being temporarily coincident, whereas much of the concern about the environment is inter-generational with the polluters and sufferers not temporarily coincident.

Second, that the source of pollution is well defined whereas many pollutants only become such after pollutants are above certain concentrations in the receiving medium while several substances deriving from different sources can contribute to one pollution problem.

Finally, one major criticism of the Pigouvian tax is the problem of estimating the marginal social damage of pollution given the need to know the environmental impact of the pollutant, their damage in terms of health, aesthetic, amenity and other cost and their monetary value. And more worrisome, the optimal Pigouvian tax is not equal to the marginal social damage at the initial level of pollution generation but rather to the damage that would be caused if the pollution were adjusted to the optimal level (Bower 1997).

A classic challenge to the Pigouvian tax is the "Coase theorem" (Barbier, 1989d). The theorem argued, that first the direction of pollution externality depend on property rights. Second, that where there is a small number of victims and polluters are equally small, it would be better for the two parties to negotiate as the use of Pigouvian tax may be unfeasible and even distorting. However, Coasian bargaining can only be feasible when the number of victims and polluters are small.

Empirical work on the pigouvian tax is done by Clark and Winters (1995) who explore the issue of global sustainability in the face of warning effects of greenhouse gas emission in China.

The study affirms that China consumes nearly 9 percent of the world's commercial energy making it the fourth largest consumer. However, energy prices in China have for many years been distorted and are in many cases set below the marginal cost of production. In this regard, if the trend

continues, China is expected to become the greatest emitter of carbon dioxide in the twenty-first century as well as a major source of methane.

As a result, China has started to question her very heavy use of coal because of its adverse effects such as acid rain and particulates release problems, which can be largely attributed to her extremely inefficient fuel use.

With this background, Clark and Winters examine the effects of raising energy prices on economic welfare and on emission levels of several pollutants. This is done using the Computational General Equilibrium model (CGE) to explore whether carbon taxes or general pricing reform allows for welfare and improvement, taking into account not only production and consumption decisions but also local and global pollutants.

They conclude that although it is impossible to produce the precise predictions of the effects of different policies in view of the highly aggregated nature of the data use, China can reduce her carbon-dioxide emission very significantly while increasing her welfare. This is because a carbon tax directed at curtailing energy use and switching consumption away from coal does actually reduces other noxious emission like sulphur dioxide and nitrous oxide. The benefit of such reduction in emissions often compensates for the loss of output it induces.

Arnold (1995), examines the effect of changes in optimal Pigouvian tax as population increases. His hypothesis was based on the notion that if population increases, current population problem will be greater in spite of a system of efficient charges for the right to pollute.

Using microeconomic techniques to develop a model of Net Social Returns, he concluded that efficient pollution charges on its own may not

provide a mechanism for compensating the original population for the adverse effect of increased pollution damage and this pollution charges may also have to be supplemented by other charges so as to retain the Net Social Return of the original population.

Blackman and Bannister (1998), also examine the implication of the Pigouvian tax by using econometric analysis to study the impact of community pressure on the adoption of clean technology in the informal sector. Using the adoption of propane as replacement for debris as source of fuel by traditional Mexican brick makers. They find that the adoption of clean technology is a function of human capital, awareness of the health cost of pollution and community pressure while firm size, exposure to government regulations and variable costs are not important factors in the adoption of clean technology by brick makers in Mexico.

2.8.3 Model Relating to Damage to Natural Environment

Babier (1989b) develops a model to analyse the prospect of irreversible damage to natural environment, arising from resource depletion and waste generation. The outcome is a steady decline in environmental quality potentially leading to the long-term disruption of important ecological functions and systems.

Babier (1989b) is germane to our study and superior to the model of Babier (1989a) because of its wide applicability to the urban environment of third world countries like Nigeria where irreversible damage to the environment is rampant.

In order to capture these relative and absolute scarcity impact of increasing environmental degradation over time, several assumptions are adopted.

First, in order to indicate the dependency of human welfare on essential environmental services and ecological functions, a stock variable representing environmental quality X_t is included along with consumption C_t as arguments in the social welfare function U :

$$U = U(C_t, X_t) \quad \dots (2.21)$$

$$U'(C_t) \geq 0, U''(C_t) \leq 0, U'(X_t) \geq 0, U''(X_t) \leq 0$$

Equation (2.21) indicates that at any time t social welfare is a concave, increasing function of consumption and environmental quality.

Moreover, the welfare function is additively separable.

$$U_{CX} = U_{XC} = 0$$

This shows that the marginal utility of each of the variable depends on the quantities of both variables.

Secondly, it is assumed that any time t any output Q_t produced by the economic system and not used for consumption, or for providing environmental improvement services v_t , or for replacing depreciated capital wK_t , leads to a net accumulation in the capital stock, $K_t - K_{t-1}$.

$$K_t - K_{t-1} = Q_t - (C_t + V_t) - wK_t \quad \dots (2.22)$$

Capital depreciates at the constant rate w . Environmental improvement services can be divided between those that directly improve environmental quality through, say, conservation practices, resource management, pollution clean-ups etc.; and those that indirectly improve environmental

quality X_t by increased recycling and the abatement of waste residuals otherwise emitted into the environment.

Thirdly, it is assumed that at any time t , as the economic process extracts resources R_t from the environment and generates (net) waste N_t , increasing environmental degradation $S_t - S_{t-1}$ occurs, causing environmental quality to decline:

$$S_t - S_{t-1} = f(R_t, N_t), \quad \dots(2.23)$$

$$X_t = X(S_t, V_t) \quad \dots(2.24)$$

$$X_t < X_{t-1} \quad \dots(2.25)$$

With $f'(R_t) > 0$, $f'(N_t) > 0$, $X'(S_t) < 0$ and $X'(V_t) > 0$.

X_t , S_t , V_t , N_t , R_t represent environmental quality, level of environmental degradation, environmental services, waste generated and extracted resources respectively.

This shows that environmental quality is a decreasing function of environmental degradation S_t , and an increasing function of environmental improvement services V_t . A crucial assumption is that, since $S_t - S_{t-1} > 0$ throughout any time period t , then X_t must also be declining.

Fourthly, the life of the economic-environmental system is assumed to be finite, where terminal time T is that period at the end of which environmental degradation reaches some maximum level S , driving environmental quality to some minimum level \underline{X} , and thus irrevocably destabilising the entire economic environmental system. This constraint on the system can be summarised as:

$$t_0 \leq t < T, \underline{X} < X_t \text{ and } U = U(C_t, X_t) , \quad \dots(2.26)$$

$$\lim_{t \rightarrow T} t, \quad \lim_{S_t \rightarrow \bar{S}} X(S_t) \rightarrow \underline{X} \text{ and } \lim U \rightarrow 0$$

Thus, this model has derived the optimal conditions for allocating economic and environmental resources in an interdependent economic-environmental system where any resource depletion and waste generation by the economic process leads to deteriorating environmental quality and an eventual ecological collapse.

As the model has stressed that the state, or quality, of the environment is an essential determinant of social welfare, environmental improvement services are recognised as a socially valuable component of economic output and, in every period, society must optimally allocate output between consumption and services to improve the environment. Although the key to expanding output is capital accumulation and growth but they can increase environmental degradation. If environmental cost exceeds benefits of economic expansion, then social value of capital accumulation, and economic growth, declines.

From the forgoing, it can be concluded that the problems of urbanisation and sustainable development in South-West Nigeria arises from:

- a) The growing human population in the area through rising demographic momentum.
- b) Increase in human economic activities and their impact and accompanying change on the urban environment of the region.
- c) The growing inequality in the standard of living in the urban areas of the region.

There is considerable evidence showing that as the South-West Nigeria population rises and income increases, environmental degradation is

worsened. This is because rapid increase in human population puts direct pressure on natural resources and the environment through increased needs for livelihood, employment and demand for goods and services.

In the South-West of Nigeria, landless poor have trooped out of rural areas into cities in search of jobs resulting in rapid pace of urbanisation and environmental degradation.

Rapid population growth have led to land, water and fuel shortages and to health related crisis in the region. Thus, rapid population growth and population density have contributed immensely to severe degradation of the very resources upon which the people depends.

For survival and to achieve sustainable development, environmental devastation needs to be halted and the productivity of existing resources increased. This requires some trade-off between output, growth and environmental concern objectives so that in the long run a number of environmental changes can provide economic savings.

Yet, it is doubtful if government can undertake the trade-off given the urgency of improving the socioeconomic conditions of the people. Thus, in the absence of any assistance, environment improvement efforts will have to be financed at the expense of social programmes like education, health services employment, housing and other socio-economic infrastructure.

Furthermore, since the Rio Earth summit of 1992 and the special session of the United Nations General Assembly on Sustainable Development in June 1997, overall progress has not been what has been targeted (World Bank 1997).

Investment in the environment has not been adequate and cost effective. The loss of forests and natural habitats has not slowed down considerably.

Furthermore, available infrastructure in the South-West cities are inadequate to cope with the growing stress on its use, thereby posing severe environmental problem in health, sanitation, housing and waste disposal.

Similarly, over-congestion, industrial and vehicular emissions, poorly ventilated household do actually worsen health and environmental conditions in the area and slow down urban productivity to the detriment of national economic development.

In essence, the review of literature has shown that economic growth, equity and quality of the environment are essential ingredients for the realisation of sustainable development. While there are models of growth and sustainable development, there is no denying that the factors of income, population density, socioeconomic infrastructure and condition of people and the environment are essential ingredients of sustainable development.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

There are three unique features of urbanisation in South-West Nigeria, which have to be incorporated into the analytical framework of our models.

Firstly, urbanisation in South-West Nigeria is a demographic dynamic pattern of spatial distribution of population, which brings about the concentration of population in towns and cities for the main purpose of meeting their economic and social desires.

Secondly, the driving force of urbanisation in South-West Nigeria is mainly the concentration of investment in socioeconomic infrastructure in the urban areas. This has played the key role of enhancing the growth and the vibrancy of urban South-West Nigeria.

Finally, the specification of the analytical framework carries the underlying assumption that although investment in socioeconomic infrastructure is the driving force of urbanisation, urban economic growth and quality of life of the people and the environment have very powerful leverage over urbanisation such that the extent of urbanisation depends on the level of urban economic growth, socio-economic and environmental conditions of the area.

Therefore, in econometric modelling of the unique features of urbanisation in the region, our focus is the urban economic growth, socioeconomic condition of the people and the environment, and simultaneous and mutual

interdependence among them and the variables of investment in socioeconomic infrastructure and urban population density.

3.2 Selection of Indicators of Sustainable Development

Our selection of indicators of sustainable development is hinged on the review of existing literature. It summarises sustainable development, as the need to attain desired balance between economic growth, socioeconomic development and environmental preservation such that future growth and overall quality of life are critically dependent on the quality of the environment.

From the work of Pearce and Watford (2003), environmental accounting entails that overall capital assets must include not only manufactured capital but also human and environmental capital. In this respect, sustainable development entails that these assets must not decline, and our model is derived directly from this proposition.

Similarly, we derived our indicators of sustainable development based on the United Nations Conference on Environment and Development of Rio, Brazil in 1992. From this conference, the United Nations Commission on Sustainable development adopted a work programme on indicators of sustainable development built on economic, social and environmental criteria [United Nations, 1996]. We adopted this initiative to select indicators that show the processes, patterns and activities, which engender sustainable development in South-West Nigeria. These are called driving force indicators.

Thus, driving force indicators of sustainable development are variables that engender the process and pattern of economic, social and environmental sustainability of the urban areas of South-West Nigeria.

These variables are identified as net investment in socio-economic infrastructure, urban blight, child malnutrition, and adult literacy rate,

Their choice, as important variables engendering sustainable development is rampant in literature (Chenery, 1996); Onokheroye, 1992). It also follows from our primary proposition that sustainable development is the balance between social and economic growth, environmental preservation and institutional development such that future growth and overall quality of life are critically dependent on the quality of the environment.

We also select other variables, which depict the current manifestation of sustainable development in South-West Nigeria and these are called the State indicators. These variables include urban income, urban unemployment and urban runoff volume.

3.3 Underlying Definitions, Methodological Descriptions and Significance of Selected Indicators to Sustainable Development

3.3.1 Investment in Socioeconomic infrastructure

This indicator deals with the processes and pattern of economic activities. It measures the stimulus to economic development, reflecting the infusion of requisite capital to finance the development process. It is closely linked with other measures of development especially the GDP per-capita.

3.3.2 Urban blight

Urban blight refers to the poor physical condition of urban structures and facilities. It usually results in filthy and unattractive environment. It is most observable in the traditional suburbs of all South-West Nigeria's urban centres where it is manifested in crowded accommodations, congested streets and buses, squatter settlements, breakdown in waste management, water and electricity shortages.

As a methodology of measurement, index of urban blight is constructed using three variables namely household with inadequate refuse disposal system, household with inadequate basic sanitation and single room household. They are employed to form a single composite index.

This indicator is closely linked with many economic, social and environmental indicators such as household income, percentage of population with inadequate excreta disposal facility, access to safe drinking water, life expectancy at birth, infant mortality, maternal mortality, morbidity, nutritional status of children, potentially hazardous materials in food, etc.

3.3.3 Industrial Growth

It is a basic determinant of the developmental aspect of Sustainable development, including consumption pattern of the people and use of renewable resources. However, it does not account for social and environmental cost of production.

3.3.4 Adult Literacy Rate

Literacy is critical for promoting and communicating Sustainable development and improving the capacity of people to address environmental and development issues. It facilitates the achievement of environmental and ethical awareness, values and skills consistent with sustainable development. It is closely linked to indicators reflecting basic needs such as education, capacity building, information and communication.

3.3.5 Urban Income

This is a basic economic growth indicator and measures the level and extent of economic output. It reflects changes in total production of goods and services and thus an important measure for the economic and

developmental aspect of sustainable development. This indicator is closely linked with other indicators like population growth, incidence of poverty and net migration.

3.3.6 Unemployment Level

This is the number of unemployed people within the labour force. It is relevant to sustainable development because it is one of the main reasons for poverty even among individuals with high education in low-income countries like Nigeria.

3.3.7 Urban Runoff Volume

The importance of this indicator is also confirmed by Oyebande (1990). He attributed the principal environmental changes arising from urbanisation to poor planning of land use for various urban functions resulting in covering of part of urban catchments with impervious spaces and compaction of the remaining non-paved surfaces. By so doing, he affirms a very strong linkage between land use factor and urban runoff volume.

Interestingly, besides the paved impervious surface areas of urban South-West Nigeria, a large number of areas in these centres are indeed unpaved, but are often so compacted that for most part are largely impervious.

As a result of imperviousness and high soil compaction arising from poor urban land use, infiltration rate is reduced resulting in increased runoff. This usually leads to gully erosion, flooding, traffic disruption and transportation of suspended solid waste particles and pollutants to sources of drinking water.

Thus, the purpose of the indicator is to show the degree of loss of productive land to non-sustainable drainage practices. It is also linked to incidence of water borne diseases.

3.3.8 Child Malnutrition Incidence

Its purpose is to measure long term nutritional imbalance and malnutrition, as well as current under-nutrition. There is no doubt that meeting nutritional requirement of children is fundamental to achieving sustainable development. Therefore, it is closely linked to adequate birth weight as well as socioeconomic and environmental indicators like incidence of poverty, access to safe drinking water, infant mortality rate and life expectancy at birth.

3.3.9 Indicator of Growth in the level of Urbanisation

Existing literature considers urban growth as the pattern of spatial distribution of population that emphasises the concentration of population in towns and cities. In this respect, the 1991 census defines Nigerian urban area as settlement with 20,000 or more inhabitants resulting in changes in landscapes.

Therefore, our employment of population density as a measure of urban demographic and social dynamics follows this consideration. It also arises from the fact that intensive concentration of population in a space makes provision of social services like housing, sanitation, transportation and security more difficult (Todaro, 2000).

3.4 Construction of Index of Sustainable Development

This index enables us to uniformly measure the level of sustainable development in South-West Nigeria. It is adapted from the Physical Quality of Life Index of Morris and Liser (1977).

$$SD = \left[1 + \frac{100 - 1}{UL_i - LL_i} V_i \right] + \left[1 + \frac{100 - 1}{UL_u - LL_u} V_u \right] + \left[1 + \frac{100 - 1}{UL_r - LL_r} V_r \right] / 3$$

It is done by converting values obtained through interval scale to values based on ratio scale.

Interval scale graduates variables by rank and order and measures the distance between rank positions in equal units. In other words, it is a scale designed to rank objects from the highest to the lowest or from maximum to minimum by attaching equal values to the differences among the objects. By so doing, it has both order and distance but has no origin.

In this respect, it does not permit the understanding of multiplicity of values since it has no specific origin.

This effect necessitates the need to convert the values of the variables of the State indicators of Sustainable development into values obtained through the ratio scale.

Ratio scale has the advantage of having all the attributes required in a complete scale namely specific origin, order and distance.

By so doing, it does not only graduate variables by rank and order, it also measures the distance between rank positions in equal distance. Above all, it starts with a specific origin.

Therefore, all the state indicators of sustainable development namely income, unemployment level and urban runoff volume are employed to form a single composite index.

For each indicator, the variable is rated on a scale of 1 to 100 where 1 represents the lowest performance and 100 the highest performance. Then sustainable development is rated and the composite index is calculated by determining the average of the ratings.

Therefore, SD is the composite index of sustainable development, UL , LL and V represent upper and lower limit of the variables of the state indicators of sustainable development namely income(i) unemployment level (u) and urban runoff volume (r) and their periodic performances respectively.

3.5 Construction of Index of Urban blight

Our construction of index of urban blight follows a similar pattern to the index of sustainable development. It enables us to measure the level of urban blight in the study area. Three variables namely households with inadequate refuse disposal system, inadequate toilet and single room households are employed to form the single composite index. The determination of the index of urban blight is presented below:

$$BL = \left(I + \frac{100 - 1}{UL_d - LL_d} V_d \right) + \left(I + \frac{100 - 1}{UL_t - LL_t} V_t \right) + \left(I + \frac{100 - 1}{UL_r - LL_r} V_r \right) / 3$$

UBL is the index of urban blight, UL and LL represent the upper and lower limit of the variables of households with inadequate refuse disposal system(d) households with inadequate toilet facility (t) and single room households (r) and V is the measurement at a given period.

3.6 Sources of Data

The data used for this study is obtained from the following sources:

- a. Federal Office of Statistics: The publication of the federal office of statistics namely General Household Survey and Abstracts of Statistics of Nigeria are the sources of data for the following variables:

- i. Household with inadequate refuse disposal system.
- ii. Household with inadequate basic sanitation.
- iii. Single room household
- iv. Adult literacy rate
- v. Urban income
- vi. Urban unemployment level
- vii. Child malnutrition incidence
- viii. Population density
- ix. Rainfall pattern

- b. South-West of Nigeria States: Ministry of Finance and Economic Planning.

Data obtained from these sources are:

- i. Investment in socio-economic infrastructure.
- ii. Tax payment by manufacturing industry.

3.7 Model Building

3.7.1 The General Analytical Framework

In the formulation of econometric models for analysis and policy evaluation, we employ the system of simultaneous equations.

This is because the application of least square to a single equation of the overall hypothesis assumes that the variables are truly exogenous and that

there is a one-way causation among the variables of urbanisation and sustainable development and the explanatory variables of investment in socioeconomic infrastructure, urban blight and literacy rate. However, the validity of these assumptions is highly suspect and the application of ordinary least square to a single equation of the model will likely yield biased and inconsistent estimates.

Our model is therefore based on our postulation of strong relationship between the index of sustainable development and the variable of urbanisation.

3.8 Specification of Models

The models employed are based on our overall hypothesis that constraints on sustainable development in the region arise from low investment in socio-economic infrastructure, high population density and poor socio-economic condition of the people.

The models are derived based on our postulation of strong relationships among the variables of urban and economic growth, socioeconomic condition of the people and environmental quality.

$$SD_t = f(URB_t) \quad \dots\dots Eq.4.1$$

SD_t and URB_t represent indices of sustainable development and urban growth respectively.

We postulate a two-way causation between the variables. By so doing, the function is treated as a simultaneous equation system to emphasise the joint dependency of the variables.

In view of our earlier theoretical submission, the explicit function of the relationship is presented below:

$$URB_t = b_1 INV_t + b_2 INV_{t-1} + \dots + b_{2n} INV_{t-n} + U_t \quad \dots Eq.4.2$$

$$SD_t = b_3 INV_t + b_4 INV_{t-1} + \dots + b_{4n} INV_{t-n} + b_5 BL_t + b_6 LIT_t + b_7 MI_t + b_8 \Delta LIT_t + U_{1t} \quad \dots Eq.4.3$$

$$INV_t = URB_t + SD_t + b_9 LIT_t + b_{10} MI_t + U_{2t} \quad \dots Eq.4.4$$

3.9 Definition of Variables

3.9.1 Endogenous variables

URB_t	=	Urban growth at period t.
SD_t	=	Sustainable development level at period t.
INV_t	=	Investment in socioeconomic infrastructure at period t

3.9.2 Exogenous variables

URB_{t-1}	=	Urban growth lag one period
SD_{-1}	=	Sustainable development lag one period
BL_t	=	Urban blight at period t
MI_t	=	Incidence of child malnutrition at period t
LIT_t	=	Literacy rate at period t
MI_{t-1}	=	Incidence of child malnutrition lag one period
LIT_{t-1}	=	Literacy rate lag one period
ΔLIT_t	=	First difference of literacy rate variable at period

INC_t	=	Average urban income at period t.
INC_{t-1}	=	Average urban income lag one period t.
$INGR_t$	=	Urban industrial growth at period t.
U_{1t} and U_{2t}	=	Stochastic terms for the equations at period t.

3.10 Technique of Estimation and Methodological Issues

Our treatment of the relationship between urbanisation and sustainable development as a system of simultaneous equation marks one of the unique features of this research as it allows for simultaneous economic analysis, policy formulation and evaluation.

We employ the Koyck's geometric lag scheme to transform the distributed lag of the investment in socioeconomic infrastructure variable in the model. This scheme assumes that the lag coefficient is declining continuously following the pattern of a geometric progression. This implies that the more recent values of the variable of investment in socioeconomic infrastructure exert greater influence on the variables of urban growth and level of sustainable development than the remote values of investment in socioeconomic infrastructure.

Therefore, the explicit function of the structural model becomes:

$$URB_t = b_1 INV_t + \lambda_2 URB_{t-1} + U_{1t} \quad \dots Eq.4.5$$

$$SD_t = b_3 INV_t + \lambda_4 SD_{t-1} + b_5 BL_t + b_6 LIT_t + b_7 MI_t + b_8 \Delta LIT_t + U_{2t} \quad \dots Eq.4.6$$

$$INV_t = URB_t + SD_{t-1} + b_9 LIT_t + b_{10} MI_t + U_{3t} \quad \dots Eq.4.7$$

We employ the two-stage least square (2SLS) econometric technique to obtain the estimates of the structural parameters. This is because it has

been accepted as the most robust of the single-equation techniques of estimation for over-identified models. It is also very effective in the elimination of simultaneous equation bias even where lags of endogenous variables are employed (Koutsoyannis, 1977).

3.10.1 Establishing Identification Status for the Equation System

Identification problem arises from the need to understand the unique statistical form of the models that would enable the unique estimates of its parameters to be made from sample data.

The order condition states that for an equation to be identified, the total number of variables excluded from it but included in other equations must be equal to or greater than the number of endogenous variables in the model less one. Suppose the total number of equations is G . The total number of variables in the model is K and M is the number of variables endogenous and exogenous included in a particular equation. The equation is identified if;

$$(K - M) \geq (G - 1)$$

In other words, the equation is identified if the total number of excluded variables is greater than or equal to the number of equations in the model minus one.

Applying the rule to each of the equations, we note that each of the equations is over-identified.

While the order condition stated above is the necessary condition for identification, the rank condition is the sufficient condition for identification. It requires that the rank of the matrix of coefficients of excluded variables

be equal to the number of equations in the simultaneous equation model minus one.

To ensure estimation, we identify the simultaneous equation model in terms of the order (necessary) and rank (sufficient) conditions. We observe that the simultaneous equations of the model are all over-identified.

3.10.2 The Reduced-Form of the Structural Model

Our model is expressed in the reduced form so that the endogenous variables can be expressed as a function for the predetermined variables only.

The reduced form parameters have the capability of measuring the total effect comprising the direct and indirect effect of a change in the predetermined variables on the endogenous variables after taking account of the interdependence among the jointly dependent endogenous variables.

Therefore, while the structural parameter indicates only the direct effect, the reduced form parameters consist of the direct and indirect effects. For example, the structural equation shows that a period lag level of Sustainable development can determine the current level through its coefficient. This is the direct effect of a period lag level of sustainable development on current level of sustainable development.

But there is also the additional effect of a period lag level of sustainable development, which in turn affects current level of investment in socio-economic infrastructure.

Similarly, a period lag level of Sustainable development does affect the current level of sustainable development, which in turn affects level of urbanisation. Thus, the total effect measured in the reduced form equation is split into two components namely: the direct and the indirect effect.

By so doing, its coefficients are very reliable for forecasting and policy analysis.

The reduced form of the model is as follows:

$$URB_t = \pi_{11}URB_{t-1} + \pi_{12}SD_{t-1} + \pi_{13}BL_t + \pi_{14}LIT_t + \pi_{15}MI_t + \pi_{16}\Delta LIT_t \quad \dots Eq.4.8$$

$$SD_t = \pi_{21}URB_{t-1} + \pi_{22}SD_{t-1} + \pi_{23}BL_t + \pi_{24}LIT_t + \pi_{25}MI_t + \pi_{26}\Delta LIT_t \quad \dots Eq.4.9$$

$$INV_t = \pi_{31}URB_{t-1} + \pi_{32}SD_{t-1} + \pi_{33}BL_t + \pi_{34}LIT_t + \pi_{35}MI_t + \pi_{36}\Delta LIT_t \quad \dots Eq.4.10.$$

$$\pi_{11} = \frac{b_1 \lambda_2}{1-b_1-b_3}$$

$$\pi_{12} = \frac{b_1 \lambda_4}{1-b_1-b_3}$$

$$\pi_{13} = \frac{b_1 b_5}{1-b_1-b_3}$$

$$\pi_{14} = \frac{b_1 b_6}{1-b_1-b_3}$$

$$\pi_{15} = \frac{b_1 b_7}{1-b_1-b_3}$$

$$\pi_{16} = \frac{b_1 b_8}{1-b_1-b_3}$$

$$w_1 = \frac{U_1 - b_1 U_2}{1-b_1-b_3}$$

$$\pi_{21} = \frac{b_3 \lambda_2}{1-b_1-b_3}$$

$$\pi_{22} = \frac{b_3 \lambda_4}{1-b_1-b_3}$$

$$\pi_{23} = \frac{b_3 b_5}{1-b_1-b_3}$$

$$\pi_{24} = \frac{b_3 b_6}{1-b_1-b_3}$$

$$\pi_{25} = \frac{b_3 b_7}{1-b_1-b_3}$$

$$\pi_{26} = \frac{b_3 b_8}{1-b_1-b_3}$$

$$w_2 = U_1 - b_1 U_2$$

$$\pi_{31} = \frac{\lambda_2}{1-b_1-b_3}$$

$$\pi_{32} = \frac{\lambda_4}{1-b_1-b_3}$$

$$\pi_{33} = \frac{b_5}{1-b_1-b_3}$$

$$\pi_{34} = \frac{b_6}{1-b_1-b_3}$$

$$\pi_{35} = \frac{b_7}{1-b_1-b_3}$$

$$\pi_{36} = \frac{b_8}{1-b_1-b_3}$$

$$w_3 = b_1 U_2 - b_3 U_2$$

3.10.3 The Indirect Effect of the Reduced-Form Parameters

The total effect is the sum of the direct and the indirect effects of changes in the predetermined variables on the endogenous variables after taking into account the interdependence among the jointly dependent endogenous variable. While the direct effect is measured by the coefficient of the structural equations, the indirect effect is therefore derived by deducting the coefficient of the structural equations from the total effect. The indirect effect of the reduced-form parameters is presented below:

$$\pi_{11} = \frac{\lambda_2 (2b_1 + b_3 - 1)}{1 - b_1 - b_3}$$

$$\pi_{13} = \frac{b_5 (2b_1 + b_3 - 1)}{1 - b_1 - b_3}$$

$$\pi_{15} = \frac{b_7 (2b_1 + b_3 - 1)}{1 - b_1 - b_3}$$

$$\pi_{21} = \frac{\lambda_2 (2b_3 + b_1 - 1)}{1 - b_1 - b_3}$$

$$\pi_{23} = \frac{b_5 (2b_3 + b_1 - 1)}{1 - b_1 - b_3}$$

$$\pi_{25} = \frac{b_7 (2b_3 + b_1 - 1)}{1 - b_1 - b_3}$$

$$\pi_{31} = \frac{\lambda_2 (b_1 + b_3)}{1 - b_1 - b_3}$$

$$\pi_{33} = \frac{b_5 (b_1 + b_3)}{1 - b_1 - b_3}$$

$$\pi_{35} = \frac{b_7 (b_1 + b_3)}{1 - b_1 - b_3}$$

$$\pi_{12} = \frac{\lambda_4 (2b_1 + b_3 - 1)}{1 - b_1 - b_3}$$

$$\pi_{14} = \frac{b_6 (2b_1 + b_3 - 1)}{1 - b_1 - b_3}$$

$$\pi_{16} = \frac{b_8 (2b_1 + b_3 - 1)}{1 - b_1 - b_3}$$

$$\pi_{22} = \frac{\lambda_4 (2b_3 + b_1 - 1)}{1 - b_1 - b_3}$$

$$\pi_{24} = \frac{b_6 (2b_3 + b_1 - 1)}{1 - b_1 - b_3}$$

$$\pi_{26} = \frac{b_8 (2b_3 + b_1 - 1)}{1 - b_1 - b_3}$$

$$\pi_{32} = \frac{\lambda_4 (b_1 + b_3)}{1 - b_1 - b_3}$$

$$\pi_{34} = \frac{b_6 (b_1 + b_3)}{1 - b_1 - b_3}$$

$$\pi_{36} = \frac{b_8 (b_1 + b_3)}{1 - b_1 - b_3}$$

3.10.4 Estimation of The Reduced Form Coefficient

The reduced form coefficient can be estimated through the method of Least-Square-No-Restrictions (LSNR). By so doing, the endogenous variables are expressed as function of all the predetermined variables of the systems and ordinary least square technique is employed to regress the equation (Koutsoyiannis, 1977)

This method of Least-Square-No-Restrictions (LSNR) is so derived because it does not take into account the restrictions imposed by the form of the structural parameter. For example, our structural equations define some coefficients as zero because the respective variables are not included in the function. This information is not however, taken into account in the method of LSNR.

In this respect, the LSNR method does not require complete knowledge of the structural system. What it requires is confirmation that the predetermined variables appear in the whole system. This technique is called the direct estimation of the reduced-form coefficients.

The second technique is the indirect estimation of the reduced -form coefficient. This is the technique that is employed in this study.

In our determination of the reduced-form of the structural parameter, we show a definite relationship between the reduced-form coefficients and the structural parameters. This shows that it is possible to first obtain estimates of the structural parameters by any appropriate econometric technique and then substitute these estimates into the system of parameter relationships to obtain the values of the total effect π 's. This method involves three steps:

First is to solve the system of endogenous variables so that each equation contains only predetermined explanatory variables. By so doing, the system of parameters' relationship is obtained.

Second is to obtain the estimates of the structural parameters by any appropriate econometric technique. The estimates of our structural parameters are obtained through the use of the Two – Stage Least Square (2SLS) econometric technique.

Third is to substitute the estimates into the system of parameter relations in order to find the estimates of the reduced-form coefficients.

Although, this method is more complicated, it has several advantages over the direct estimation of the total effect π 's from the LSNR method. These advantages are:

First, the derivation of the reduced-form total effect π 's from the structural coefficients is more efficient because it takes into account all the information incorporated into the structural model. That is to say that it takes into account all the a-priori restrictions imposed by the structure on the parameters.

Second, structural changes occur continuously over time. Therefore if the changes in the coefficients b 's and π 's are known, it can be easily incorporated into the system of parameters' relationship. This would make it possible to compute the total effect π 's.

But if the total effect π 's are computed using the LSNR method, it will not, in general, be possible to take the information into account. This is because each of the total effect π 's is a function of several structural parameters and if the exact relationship between the total effect π 's and coefficients b 's and π 's has not been established, the changes that have occurred cannot be incorporated.

And finally, extraneous information on some structural parameters from other studies may become available, and such information will be useless if the total effect π 's has not been estimated from the estimates of the coefficients b 's and π 's.

3.11 Specification of other Models

Our hypothesis that investment in socioeconomic infrastructure facilitates considerable economic, social and environmental impact is well grounded in literature. (Lying, 1995; Aromolaran, 1998). Conventional wisdom also holds that this type of investment is very crucial to economic growth and development potentials since it provides access to resources, goods, services and markets.

Therefore, in our analysis of the productivity of investment in socioeconomic infrastructure in the urban areas of the region, we adapted the pattern of Iyoha (1998). We use econometric technique to test the relationship between the variables of urban economic growth and investment in socio-economic infrastructure measured by the ratio of aggregate investment in socioeconomic infrastructure to total income and urban blight.

We specify that urban economic growth depends on the distributed lag of investment in socio-economic infrastructure-income ratio.

$$\text{Log } (Y_t) = a_0 + b_1 \text{Log}(INV/Y)_t + \dots + b_n \text{Log}(INV/Y)_{t-n} + \text{Log } (bl_t) + e_t$$

...Eq.4.11

Using Koyck's transformation, our postulation gave a final form of equation where urban economic growth depends on current Investment in socio-economic infrastructure-Income ratio and a one period lag value of average urban income

$$\text{Log } (Y_t) = a_1 + b_1 \text{Log } (INV/Y)_t + b_2 \text{Log } (Y_{t-1}) + \text{Log } (bl_t) + V_t$$

...Eq.4.12

Where:

Y_t = Urban economic growth at period t;

INV/Y_t = Investment in socioeconomic infrastructure-income ratio at period t.

We also determine the effect of industrial growth on urban blight in the region.

$$Bl_t = a_0 + INGR_t + e_t$$

...Eq.4.13

Where:

Bl_t = Urban blight at period t;

$INGR_t$ = Industrial growth at period t.

We use the quadratic function technique to determine whether population density in urban areas of the region has reached a critical threshold on which it impacts negatively on the index of sustainable development.

$$SD = a_0 + b_1URB_t + b_2URB_t^2 \quad \dots Eq.4.14$$

$$dSD / dURB > 0, d^2SD / dURB < 0$$

Where:

SD_t = Sustainable development at period t;

URB_t = Level of urbanisation at period t.

In specifying the equations, we tried to reconcile economic theory with technical consideration. A linear relationship is assumed in the theoretical specification for analytical and computational convenience only. However, the true functions of the equations are determined empirically using computer for estimation.

CHAPTER FOUR

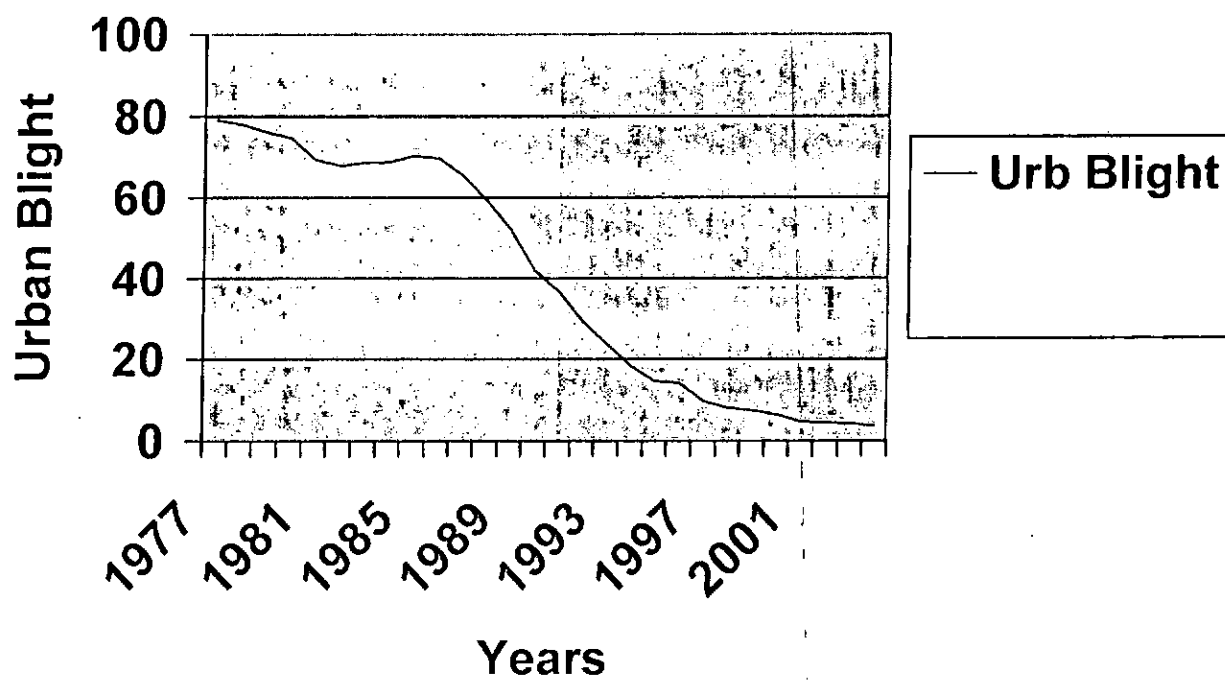
Empirical Analysis of Findings and Discussion

4.1 Trends of Urban Blight and Sustainable Development in Urban South-West Nigeria

The empirical findings on the comparison of the trends of levels of sustainable development and urban blight in the urban areas of South-West Nigeria are presented in Figures 4.1 to 4.8.

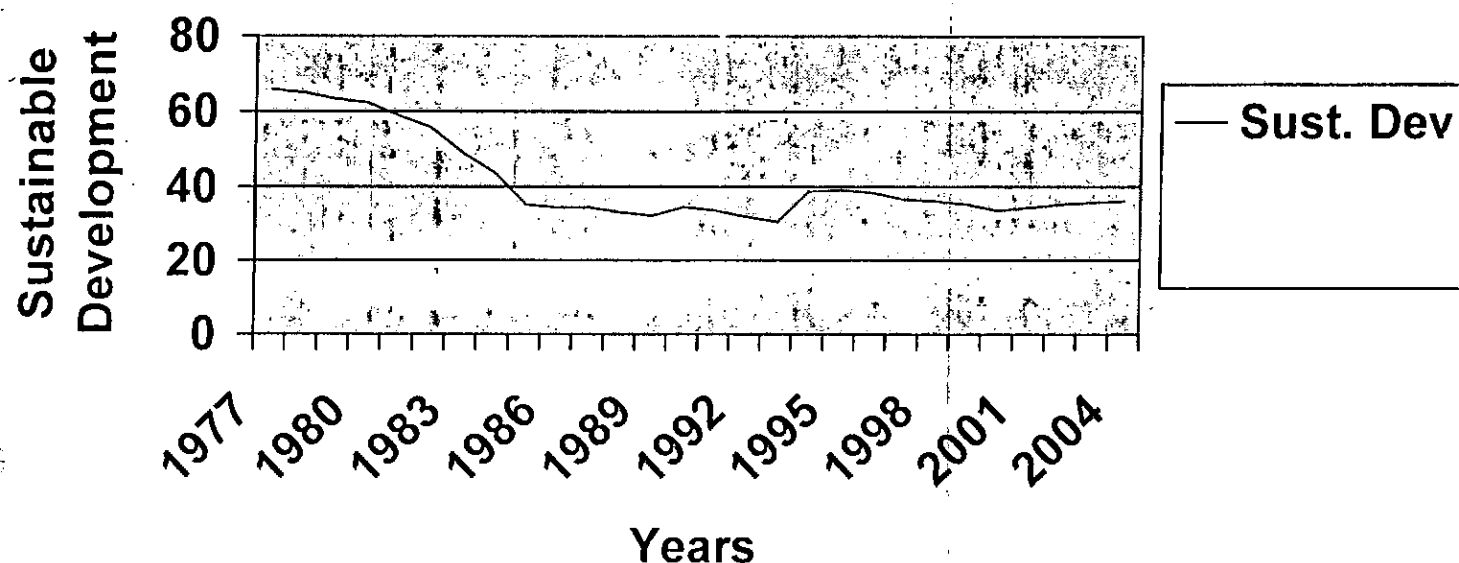
Considering the trend in Figure 4.1, evidence suggests that in the early period of the study in the urban areas Lagos State, incidence of urban blight was rampant but this gradually abatement at the latter abated over time. This can perhaps be attributed to the effectiveness Lagos State government's environmental and sanitation policies. (Edict no 9 1988. No. 12 1994).

**FIG. 4.1 Trend of Urban Blight in
Lagos State (1977-2004)**



The trend of sustainable development in the urban areas of Lagos State is presented in Figure 4.2

Fig. 4.2 Trend of Sustainable Development in Urban Areas of Lagos State (1977-2004)



It shows high trend at the earlier period of the study. This could perhaps be attributed to the buoyancy of the Nigerian economy, which improved urban income and reduced urban unemployment at the period. The decline in the trend corresponds with the beginning of the downturn of the economy in the early eighties. The trend fell precipitously in the middle eighties. It is clearly not a coincidence that the precipitous fall coincides with the advent of Structural Adjustment Programme (SAP).

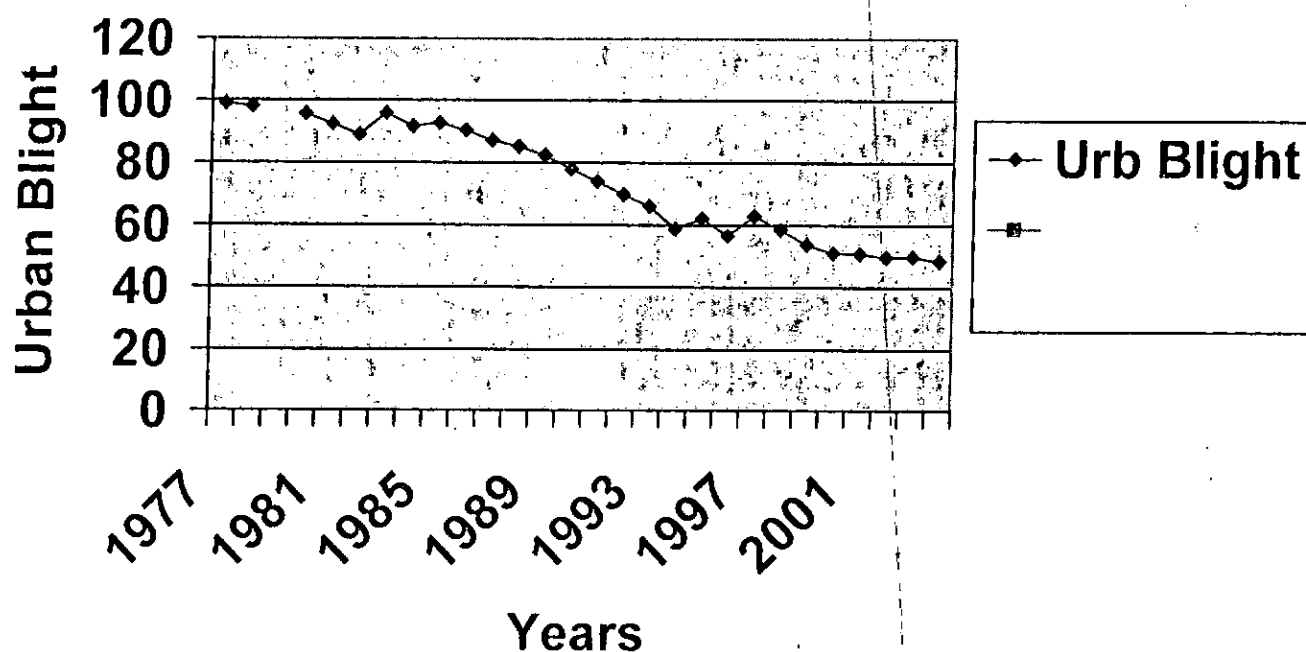
According to Ukwu (1995), SAP was created to enhance the performance of the economy. But actual performance showed that the relative

expenditure on social and environmental services was even lower than budgeted.

The depressive impact of the SAP and its implementation was severe, creating widespread unemployment and idle industrial capacity. The GDP at constant prices recorded a minimal 1.8 percent increase reflecting a fall in per-capita income while the massive devaluation of the Naira raised the annual inflation rate to two digits.

The trend of urban blight in Ogun State is shown in Figure 4.3.

fig. 4.3 Trend of Urban Blight in Ogun State (1977-2004)



The figure shows that the trend of urban blight was high at the early period. However, it fell at the latter period of the study, but the fall was not as palpable as it was in Lagos State.

Trends of sustainable development in the urban areas Ogun, Oyo and Ondo States are shown in (Figures 4.4, 4.6 and 4. 8).

Fig.4.4 Trend of Sustainable Development in Urban Areas of Ogun State (1977-2004)

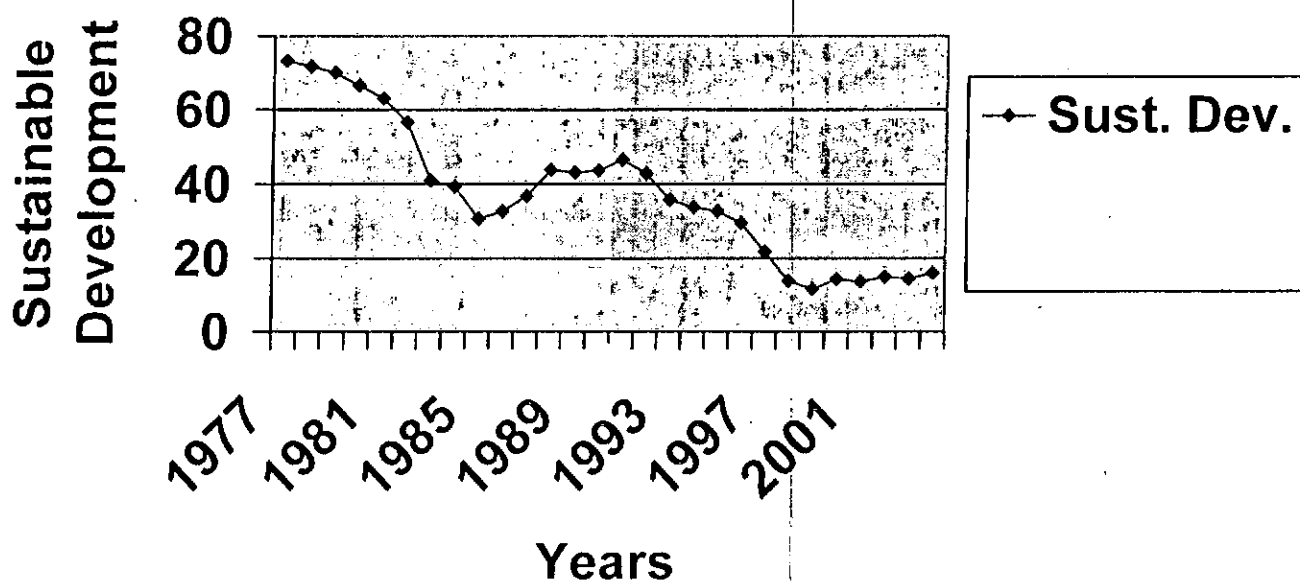


Fig. 4.5 Trend of Sustainable Development in the Urban Areas of Oyo State (1977-2004)

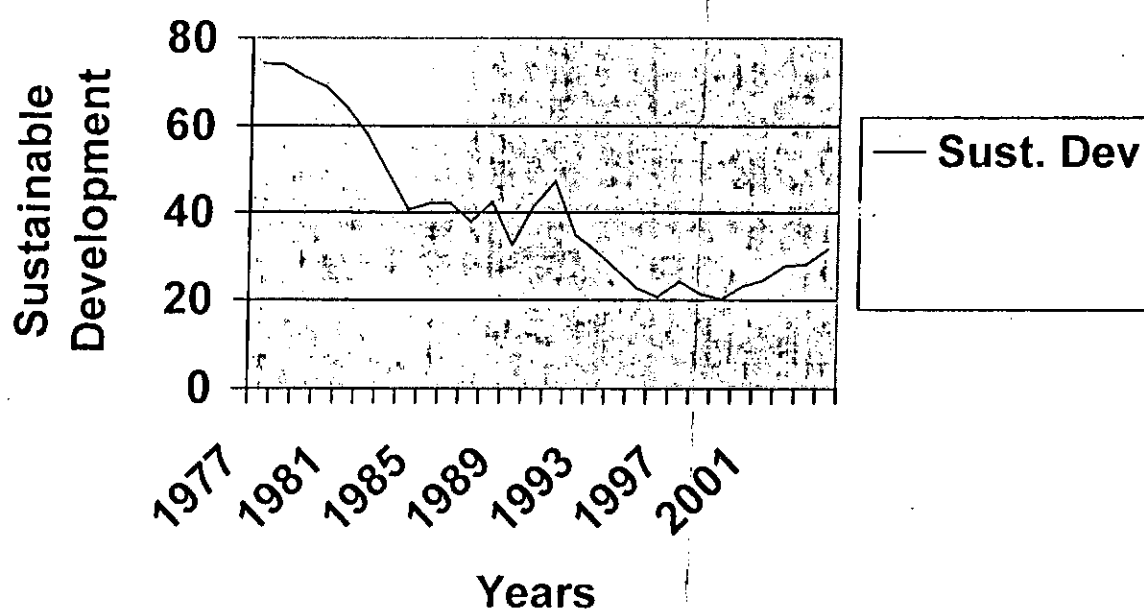
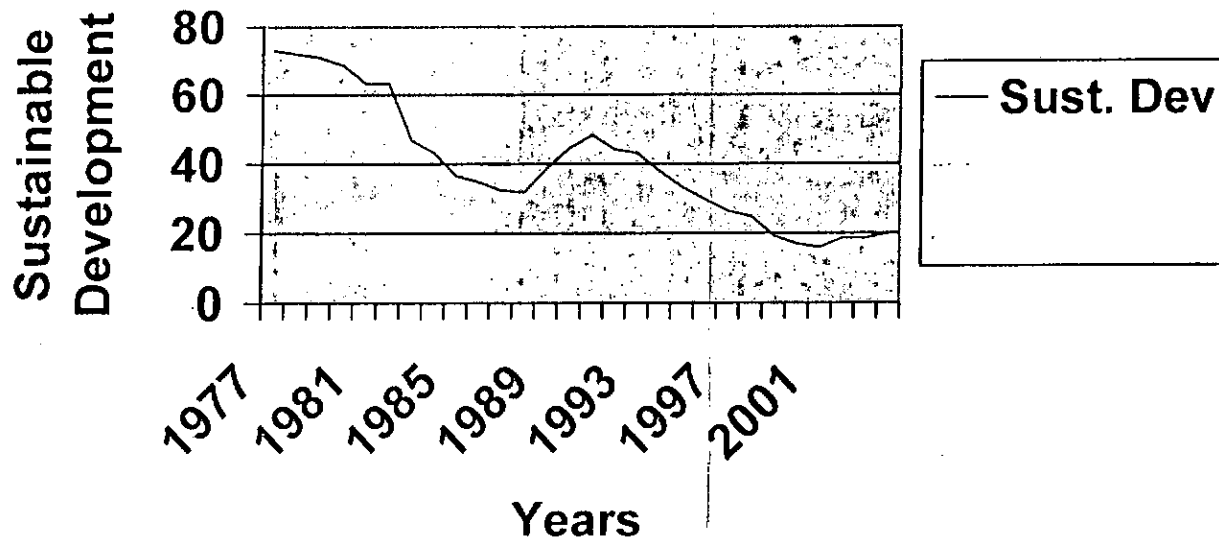


Fig.4.6 Trend of Sustainable Development in the Urban Areas of Ondo State (1977-2004)



The trends of sustainable development in the urban areas of Ogun, Oyo and Ondo States actually present an interesting dimension to our result. It is not a surprise that the trends were high at the earlier part of the study. In fact Ukwu (1995) affirms a series of measures, which cumulated in the expansion of the Nigerian economy as a result of the oil boom of the 1970s.

However, the interesting gist of our findings is the palpable rise in these trends at the height of the Structural Adjustment Programme (SAP) 1988. There is no doubt that these three South-West States are agrarian States in spite of their level of urbanisation.

While SAP did appear to have depressing effect on the trend of Sustainable development in the urban areas of Lagos State, figures 4.4, 4.5 and 4.6 show that it had elevating effect on the trends of Sustainable development in the other three states perhaps because of their agricultural economy.

Olayemi and Dittoh (1995) chronicled the positive impact of SAP on Nigerian agricultural economy. They assert that the agricultural sector's GDP at 1984 factor cost increased from an average of 24.7 billion Naira per annum in the pre-SAP period of 1981-1985 to 328 billion Naira under SAP from 1986 to 1990. Similarly, the index of agricultural production, which declined at an average annual rate of 2.7 percent between 1981-1985, increased at an annual rate of 6.2 percent under SAP.

Figure 4.7 shows the trend of urban blight in the urban areas of Oyo State. In the urban areas of Oyo State (Fig. 4.7) the incidence of urban blight was phenomenal but later abated towards the end of the study period.

Similarly, the urban areas of Ondo State were equally blighted (Fig. 4.8), especially during the structural adjustment period when agricultural reforms had elevating effect on the economy of its urban areas.

Fig.4.7 Trend of Urban Blight in Oyo State

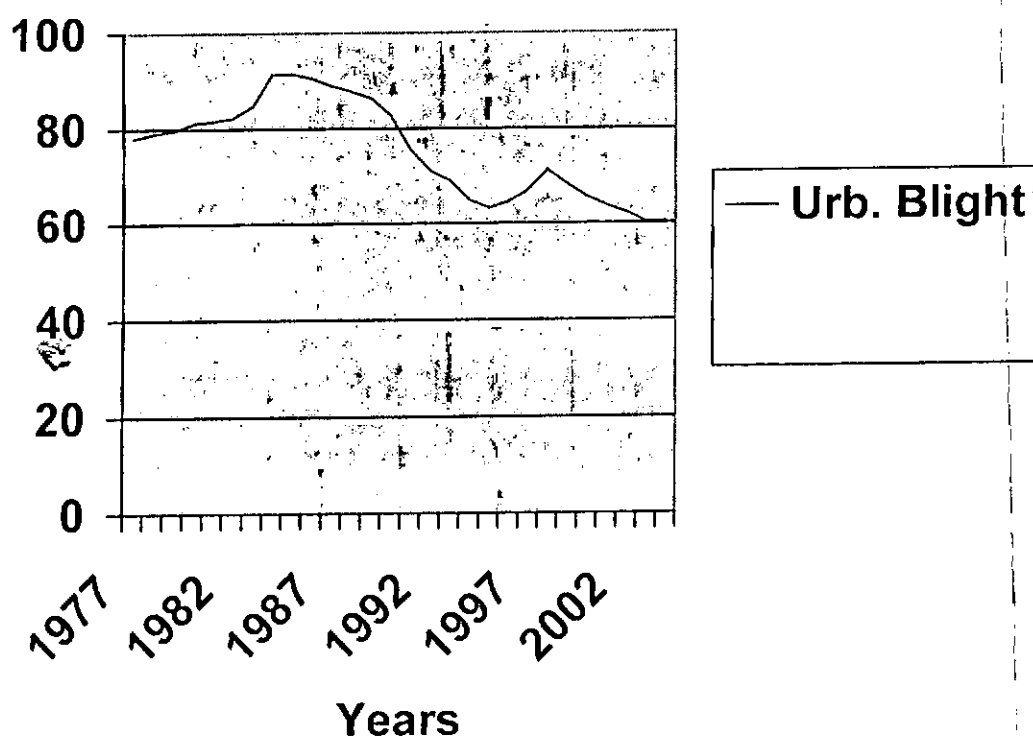
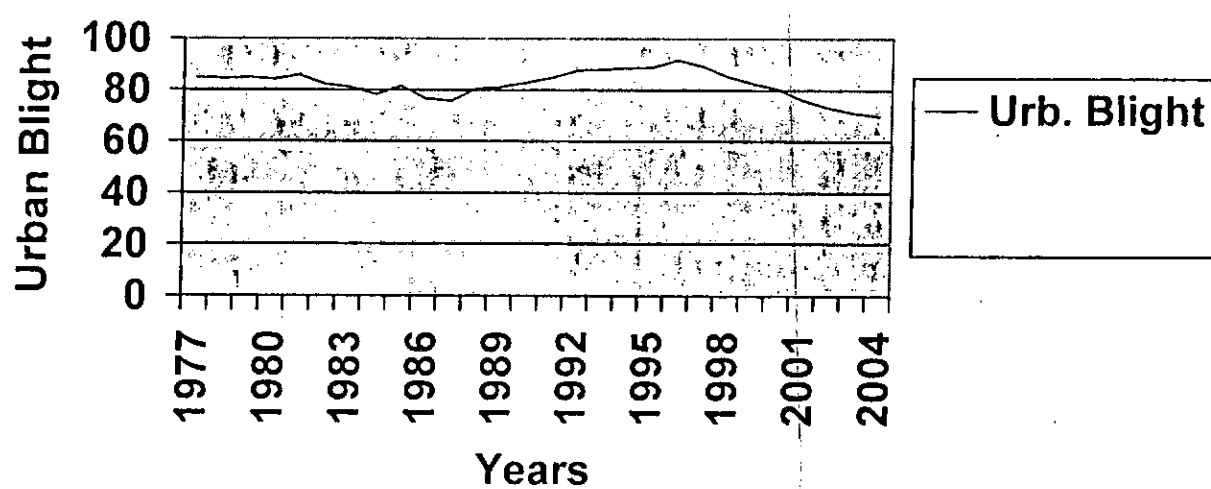


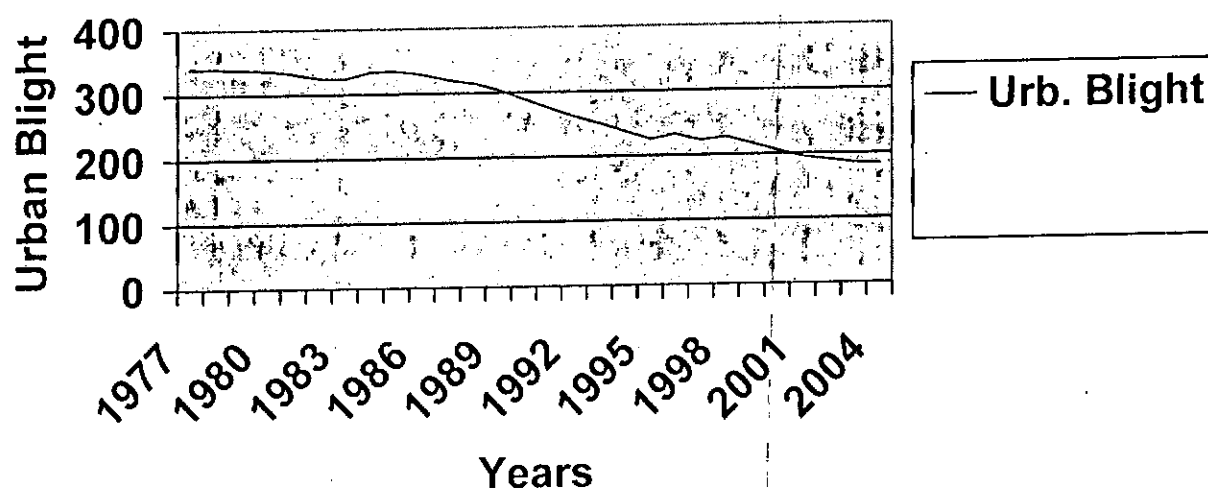
fig.4.8 Trend of Urban Blight in Ondo State (1977-2004)



The trend of urban blight in South-West Nigeria between 1977 and 2004 is presented in figure 4.9 below.

The figure 4.9 shows that the incidence of urban blight is high in the earlier period of the study but gradually reduced over the study period.

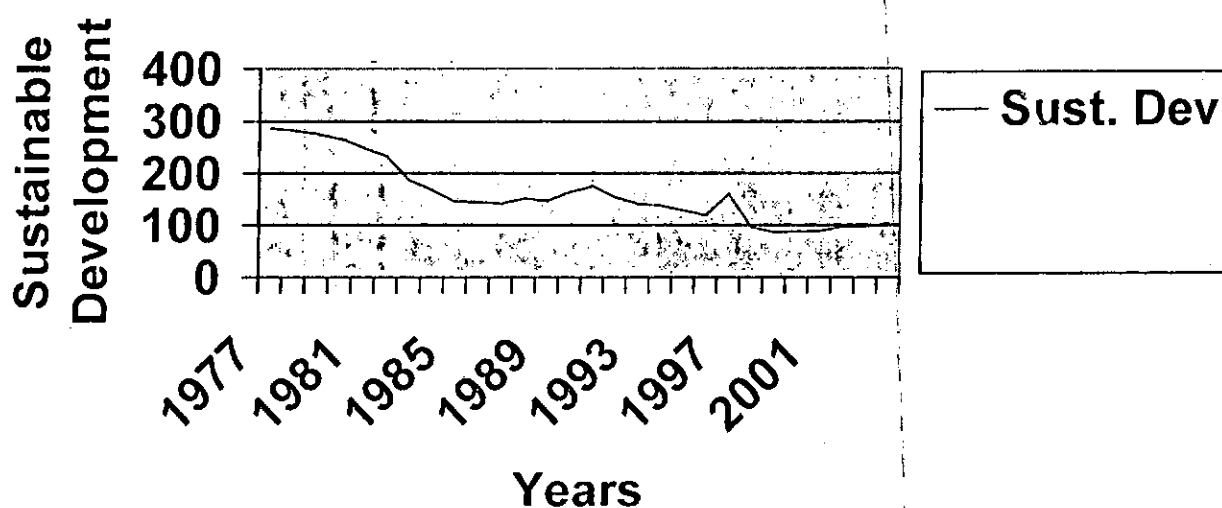
Fig.4.9 Trend of Urban Blight in South-West Nigeria (1977-2004)



The trend of sustainable development in the urban areas of South-West Nigeria between 1977 and 2004 is presented in fig 4.10 below.

It shows high trend at the earlier period of the study, but fell at the beginning of the downturn of the economy. It however rises slightly during the Structural Adjustment Programme (SAP) to perhaps show the influence of agriculture on the economy of a number of urban areas of South-West Nigeria.

Fig.4.10 Trend of Sustainable Development in the Urban Areas of South-West Nigeria. (1977-2004)



4.2 Findings on the Effect of Urbanisation on Sustainable Development In Urban Areas of Lagos State.

The empirical results on our postulation on the constraints and driving force of sustainable development in the urban areas of Lagos State are presented in Tables 4.1 and 4.2.

In Table 4.1, the estimated coefficients, the values and diagnostics are all indicated. Table 4.1 shows that for the period under study, developments in the incorporated variables explain more than ninety-eight percent variations in the level of growth in urban areas of Lagos State. Similarly, stability of the overall regression equation is highly significant (Appendix 2).

Table 4.1. Investment in Socioeconomic Infrastructure and Urbanisation- Lagos State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	-245.2056	-0.803724
<i>INV</i>	2.118650	1.122358
<i>URB(-1)</i>	1.070995	18.19954
<i>Adjusted R-squared</i> 0.981823		
<i>Prob(F-statistic)</i> 0.000000		

The result confirmed our a priori expectation regarding the behaviour of the factors contributing to the growth in the level of urbanisation.

It shows that previous growth in the level of urbanisation is a major determinant of the current level of growth. This is highly statistically significant at one-percent showing that a major driver of urbanisation in Lagos State is the past level of growth of urban areas.

However, the variable of investment in socioeconomic infrastructure is not significant implying that there is no evidence of contribution of investment in socioeconomic infrastructure to the growing level of urbanisation in Lagos State

Table 4.2 indicates the estimated coefficients, the values and diagnostics. Table 4.2 shows that for the period under study, developments in the incorporated variables explain more than ninety-six percent of the systematic variation in the level of urban growth in Lagos State. Similarly, stability of the overall regression equation is highly significant. The Durbin-Watson is plausible (Appendix 3).

Table 4.2: Quality of Life and Sustainable development -Lagos State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	-2.956848	-0.640507
<i>INV</i>	0.024744	1.099447
<i>SD(-1)</i>	0.845417	12.56961
<i>BL</i>	-0.075929	-2.714745
<i>LIT</i>	4.34E-07	0.070385
<i>MI</i>	2.800692	2.720048
<i>D(LIT)</i>	-4.77E-07	-0.077859
<i>Adjusted R-squared</i>	0.956558	
<i>Prob(F-statistic)</i>	0.000000	

The result itself confirms our a-priori expectation regarding the effect of the previous level of sustainable development and urban blight on current level of sustainable development.

It shows that for every ten-unit increase in lag level of sustainable development current level increases by eight units. This is statistically significant at one-percent level.

This shows that a period lag level of sustainable development is crucial to attaining higher current level of sustainable development.

Similarly, our a-priori expectation that urban blight is one major reason for deterioration of level of sustainable development in the urban areas of Lagos State is confirmed in Table 4.2. It shows that a unit increase in urban blight brings down the level of sustainable development by about one tenth. It is also statistically significant at one-percent level.

The variable of investment in socioeconomic infrastructure shows no statistical significance even at ten-percent level indicating that there is no reliable evidence of contribution of investment in socio-economic infrastructure to sustainable development in the urban areas of Lagos State.

This perhaps could be attributed to the growing deterioration of the socio-economic infrastructure arising from lack of maintenance and poor system of urban planning in the State.

Similarly, the coefficient of incidence of malnutrition is not significant even at ten-percent level suggesting evidence that this variable has no perceptible impact on the level of sustainable development in Lagos State.

This may perhaps arise from the fact that average Nigerians nutritional intake has consistently been falling below the recommended threshold of the Food and Agricultural organisation (FAO) (Olayemi, 1998).

Olayemi (1998), confirmed that while the minimum energy intake of 2250 kilocalories per-capita per day and a protein intake of 65 grams per day recommended by the FAO are used as threshold for nutritional adequacy, the average Nigerian energy and protein intake fell short of the minimum.

He further affirms that most of the protein intake of Nigerian was derived from cereals, starchy foods, grain legumes and vegetable oil. They together accounted for about 84 percent of the total protein intake while livestock and fish products, which are the major sources of best quality protein, supplied a paltry 9.5 percent of the total protein intake. This is a clear manifestation of qualitative imbalance in nutritional intake.

Moreover, the general insignificance of literacy and growth rate of literacy suggest that no categorical conclusion could be drawn on the effect of education on attaining increased level of sustainable development in the urban areas of Lagos State.

In other word, the consequent lack of statistical significance of the literacy and growth rate of literacy even at ten percent level suggest that the level and growth of education in urban areas of Lagos are not contributing to inducing the growth of sustainable development in the areas.

Realising that the t-value of the analysis of the impact of investment in socioeconomic infrastructure on Sustainable development is not significant (Table 4.2), we went further for conclusive evidence.

We test the relationship between urban economic growth and the role of investment in socioeconomic infrastructure in the areas (Table 4.3).

The estimation of the parameter is carried out using an OLS procedure. This is done with an implicit assumption of unidirectional relationship between urban economic growth and the role of investment in socioeconomic infrastructure in urban economic growth process and urban economic growth lagged one period.

An examination of the equation reveals good results with high R^2 , significant F-values, and significant t-values for both explanatory variables. It shows that the regression explains over ninety percent of the observed

variation in the economic growth variable. Furthermore the stability of the overall regression is significant (appendix 4).

Therefore the assumption of a log linear relationship between urban economic growth and the explanatory variables of role of investment in socio-economic infrastructure, a period lag level of urban economic growth and urban blight is validated.

Table 4.3: Investment in Socioeconomic Infrastructure and urban Economic Growth – Lagos State

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	0.683539	1.344547
LOG(INVINC)	0.002524	0.136819
LOG(INC(-1))	0.941030	17.21546
LOG(BL)	-0.045068	-3.219574
<i>Adjusted R-squared</i>	0.922336	
<i>Durbin-Watson stat</i>	1.721694	

In the same vein, while the result shows a positive relation between lag level of urban economic growth and current level, it shows a negative coefficient for the variable of urban blight. This confirms our a-priori expectation that while the previous level of urban economic growth is a major factor in enhancing current level of urban economic growth, urban blight is a major inhibiting factor to urban economic growth in Lagos State.

The findings in Table 4.2 show the inconclusive evidence with regards to the contribution of investment in socioeconomic infrastructure to increased level of sustainable development in the urban areas of Lagos State. Similarly, our findings in Table 4.3 equally confirm the inconclusiveness of evidence regarding the role of investment in socioeconomic infrastructure

on economic growth of urban areas of Lagos State, given the fact that the coefficient of investment in socioeconomic infrastructure – economic growth ratio is statistically insignificant.

This finding is very close to the findings of Soludo (1998) which provides evidence to show that in Nigeria, investment is not a major driver of economic growth.

It also corroborates the findings of Easterly (1997) for 71 other developing countries.

Table 4.4 shows the result of the effect of industrial growth on urban blight in the urban areas of Lagos State. The estimated coefficients and the values and diagnostics are all indicated in Appendix 5. It shows that for the period under study, the incorporated variables explain over fifty – five percent of the observed variation in the level of blight in urban areas of Lagos State. The stability of the overall regression equation is significant.

Table 4.4: Industrial Growth and Urban Blight Relationship – Lagos State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	127.9845	8.347614
<i>Industrial Growth</i>	-0.392044	-5.895273
<i>R-squared</i>	0.572046	
<i>Durbin-Watson statistic</i>	0.261146	

It shows that industrial growth is a major inhibiting factor of urban blight in the State. The result is significant at one-percent level.

Our findings on the effect of population density on the level of sustainable development in Lagos State is very revealing (Table 4.5). The DW, the R^2 , F-value and t-values are all indicated and show good results (Appendix 6).

Table 4.5 shows that for the period under study, developments in the incorporated variables explain more than seventy-eight percent of the observed variation in the level of sustainable development in the urban areas of the State. Similarly, the stability of the overall regression equation is significant at one-percent level.

Table 4.5: Population Density and Sustainable Development in Urban Areas Lagos State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	87.50762	15.36945
URB	-0.039601	-6.800498
URB ²	7.00E-06	5.588518
<i>Adjusted R-squared</i> 0.766779		
<i>Durbin-Watson statistic</i> 0.249541		

The result confirms our a-priori expectation regarding the behaviour of the growing rate of urbanisation on sustainable development in Lagos State.

It confirms that the general fear of possible over-urbanisation in the urban areas of Lagos State and that population density may surpass the threshold to have negative impact on the level of Sustainable development.

4.2.2 The Indirect Effect of Changes in the Predetermined Variables on Urbanisation and Sustainable Development in Lagos State.

The indirect effect of changes in the identified predetermined variables on the variables of urbanisation, Sustainable development and investment in socioeconomic infrastructure is presented in Table 4.6.

Table 4.6: Indirect Effect of Predetermined Variables in Lagos State

<i>Endogenous Variables</i>	<i>Predetermined Variables</i>					
	Urb_{t-1}	SD_{t-1}	BL_t	LIT_t	MI_t	ΔLIT_t
Urb_t	-3.054	-2.41	0.216	1.1×10^{-5}	-7.98	-1.1×10^{-5}
SD_t	-2.165	-1.71	0.153	-8.1×10^{-6}	-5.66	8.1×10^{-6}
INV_t	-2.01	-1.58	0.142	-8.1×10^{-8}	-5.25	8.1×10^{-8}

Considering the variables that are significant regarding the structural parameter, it can be seen from the structural equation that an increase in the lag growth level of urbanisation does increase current growth level of urbanisation. By so doing, the indirect effect of lag growth level of urbanisation through its effect on the magnitude of the current growth level affects investment in socioeconomic infrastructure.

Investment in socio-economic infrastructure also affects urbanisation. Therefore, the value of the indirect effect of lag level of growth of urbanisation through this process is negative. This implies that the indirect effect of lag level of growth of urbanisation does actually suppress the growth of urbanisation in the urban area of Lagos State.

Similarly, the value of the indirect effect of lag level of sustainable development on current level is negative.

It implies that while the direct effect sustainable development enhances the current level, increase in the magnitude of the current level of sustainable development affects investment in socio-economic

infrastructure, which in turn affects sustainable development. This process has a depressing effect on the current level of sustainable development.

In the same process, the coefficient of the structural equation shows that urban blight usually brings down the level of sustainable development in the urban areas of Lagos State. However, this effect on sustainable development affects investment in socio-economic infrastructure, which in turn positively affects the level of sustainable development.

4.3 Findings on the Effect of Urbanisation on Sustainable Development in Urban Areas of Ogun State

Tables 4.7 and 4.8 show the results on the estimate of the constraints and driving force of sustainable development in urban areas of Ogun State. The results indicate that for the period 1977-2004, developments in the incorporated variables in Table 4.7 explained more than ninety-eight percent of the systematic variation in level of sustainable development in the areas.

The estimated coefficients, the values and diagnostics are all indicated and show good results. The overall regression equation is very stable (Appendix 7).

Table 4.7: Investment in Socioeconomic Infrastructure and Urbanisation in Ogun State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	19.09461	1.541286
<i>INV</i>	-0.300641	-1.001738
<i>URB(-1)</i>	0.968637	21.91280
<i>Adjusted R-squared</i>	0.987280	
<i>Prob(F-statistic)</i>	0.000000	

The result shows, as it was in the findings for urban areas of Lagos State that previous growth in the level of urbanisation is a major determinant of the current growth of urban areas of Ogun State.

It is statistically significant at one-percent level implying that a major driver of urbanisation in Ogun State is the previous level of growth of its urban areas.

However, the variable of investment in socioeconomic infrastructure is not significant even at ten-percent implying that there is no conclusive evidence to show that investment in socio-economic infrastructure contributes to urbanisation in Ogun State.

Table 4.8 presents the result of the effect of quality of life in urban areas of Ogun State on the level of sustainable development.

The regression shows that in the period under study, developments in the incorporated variables explain more than ninety-five percent of observed variation in the growth of the level of sustainable development in the urban areas of the State (Appendix 8).

The F – value is significant at one-percent level indicating that there is a significant relationship between the six variables taken together and the level of sustainable development. The signs of all the coefficients are correctly indicated and three of the t – values are significant.

The stability of the overall regression is also very good while the regression itself is free from serial correlation.

Table 4.8: Quality of Life and Sustainable development in Urban Areas of Ogun State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	64.67334	3.046713
<i>INV</i>	0.199159	0.793054
<i>SD(-1)</i>	0.551442	2.188496
<i>BL</i>	-0.318469	-2.017035
<i>LIT</i>	-0.000462	-3.061567
<i>MI</i>	-0.099213	-0.287985
<i>D(LIT)</i>	0.000116	0.963951
<i>Adjusted R-squared</i>		0.961945
<i>Prob(F-statistic)</i>		0.000000

While a number of the coefficients of the variables are not significant, the coefficient of lag level of sustainable development is positive and significant.

The variable of the lag level of sustainable development is significant at five-percent level. This suggests that the lag level of sustainable development have positive impact on current level. And that for every one

unit gain in the lag level, the current level is certain to increase by half a unit.

Similarly, the variable of urban blight is significant at five percent level indicating that every unit increase in the level of urban blight will drive down the level of Sustainable development by a third of a unit.

However, the variable of investment in socioeconomic infrastructure is not significant despite being correctly signed. This shows that the role of investment in socioeconomic infrastructure in increasing the level of sustainable development in urban areas of Ogun State is not obvious.

Although the coefficients of the variables of child malnutrition and growth in literacy are correctly signed, they are however not significant, indicating that their roles in influencing the level of sustainable development is still cloudy.

One revealing aspect of our findings is the significant and negative coefficient of literacy variable in the urban areas of the state. This result shows that increase literacy is a constraint to attaining high level of sustainable development in the urban areas of Ogun State.

This is in line with the findings of Odusola (1997), which shows a weak relationship between human capital development and economic growth in Nigeria.

It is also an affirmation of Ojo (1986 : 85). He shows that in general terms, the quantitative trends of education in Nigeria may suggest some progress in educational development. However, falling standards and rising students wastage, low transition from one stage to another, structural imbalance in the educational system, shortage of teaching staff, unplanned and

uncoordinated expansion of different levels of education and low level of female participation are all contributions to steep decline in education.

Given the non-significant coefficient of the investment in socioeconomic infrastructure variable on the level of Sustainable development, we test the relationship between urban economic growth and the role of investment in socioeconomic infrastructure on the economic growth process. This is to enable us generate conclusive evidence about the behaviour of investment in socioeconomic infrastructure in the process of urban economic growth in the areas. (Table 4.9).

The estimated coefficients, the values and diagnostics are all indicated. The regression is able to explain over ninety-two percent of the observed variation with strong overall regression stability (Appendix 9).

Table 4.9: Investment in Socioeconomic Infrastructure and Urban Economic Growth–Ogun State

<i>Variable</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	<i>0.600432</i>	<i>0.606943</i>
<i>LOG(INVINC)</i>	<i>0.005314</i>	<i>0.098479</i>
<i>LOG(INC(-1))</i>	<i>0.873879</i>	<i>8.858511</i>
<i>LOG(BL)</i>	<i>0.113691</i>	<i>0.620214</i>
<i>Adjusted R-squared</i>	<i>0.924540</i>	
<i>Durbin-Watson stat</i>	<i>1.039251</i>	

The coefficient of the lag level of economic growth is correctly signed and significant, confirming the dependency of current urban economic growth on past economic growth level.

The variable of the role of investment in socioeconomic infrastructure on urban economic growth is negatively signed. It is also not significant even at ten percent level.

This confirms our earlier findings (Table 4.8) that the role of investment in socio-economic infrastructure in the economic growth process of urban areas of Ogun State is not obvious.

These findings support an earlier finding by Adenikinju (1998), which reports a negative relationship between investment and economic growth in Nigeria.

The function of the variable of urban blight in the economic growth process of urban areas of Ogun State is not well defined given the fact that the value of the coefficient is not significant.

Findings on the effect of industrial growth on growth of urban blight in Ogun State are presented in Table 4.10.

The estimated coefficients and the values and diagnostics are all indicated. It shows that for the period under study, the incorporated variables explain over forty five percent of the observed variation in the level of blight in urban areas of Ogun State. The stability of the overall regression equation is significant at one-percent level (Appendix 10).

Table 4.10: Industrial Growth and Urban blight - Ogun State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	128.8987	11.18124
INGR	-1.049797	-4.681925
<i>R-squared</i>	0.457434	
<i>Durbin-Watson statistic</i>	0.254396	

The result indicates an inverse relationship between industrial growth and urban blight in the State (Table 4.10).

Similar to the urban Areas of Lagos State, the result shows that industrial growth is a major inhibiting factor of urban blight in the State. This implies that industrial growth can be a panacea for reducing urban blight in the State.

Our results on the effect of population density on level of Sustainable development in the urban areas of Ogun State are quite interesting and different from the result for the urban areas of Lagos State despite the proximity of the two States (Table 4.11).

The estimated coefficients and the values and diagnostics are all indicated. It shows that for the period under study, the incorporated variables explain over eighty percent of the observed variation in the level of sustainable development in urban areas of Ogun State. The stability of the overall regression equation is significant at one percent level (Appendix 11).

Table 4.11: Population Density and Sustainable Development in Urban Areas of Ogun State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	89.99894	8.421486
<i>URB</i>	-0.404906	-3.067816
<i>URB²</i>	0.000504	1.419300
<i>Adjusted R-squared</i> 0.790721		
<i>Durbin-Watson statistic</i> 0.355347		

The test shows that the coefficients of the variables of population density and square of population density are both significant at one-percent level. While the coefficient of the population density variable is negative, that of the square of population density is positive indicating a marginal contribution of urbanisation to sustainable development in the urban areas of the State.

4.3.2 Indirect Effect of Predetermined Variables on Urbanisation and Sustainable Development in Ogun State.

The indirect effect of changes in the predetermined variables on the variables of urbanisation, sustainable development and investment in socio-economic infrastructure in Ogun State of Nigeria is presented in Table 4.12.

Table 4.12. Indirect Effect of Predetermined Variables on Urbanisation and Sustainable development in Ogun State.

<i>Endogenous Variables</i>	<i>Predetermined Variables</i>					
	Urb_{t-1}	SD_{t-1}	BL_t	LIT_t	Mt_t	$D\Delta LIT_t$
Urb_t	-1.23	-0.702	0.405	5.8×10^{-4}	0.126	-1.5×10^{-4}
SD_t	-0.794	-0.452	0.087	3.8×10^{-4}	0.081	-9.5×10^{-5}
INV_t	-0.09	-0.052	-0.029	4.2×10^{-5}	0.009	-1.1×10^{-5}

Considering the variables whose coefficients in the structural equation are significant, Table 4.12 shows that the indirect effect of lag growth level of urbanisation on current growth level is negative.

It implies that when the lag growth level of urbanisation, which directly influences the current growth level increases, the effect affects investment in socio-economic infrastructure, which in turn affects growth of urbanisation. The totality of all these indirect effects has negative impact on the growth of urbanisation in Ogun State.

In the same vein, the coefficient of the structural equation shows that the lag level of sustainable development positively influences the current level of sustainable development. This effect on the current level also affects investment in socioeconomic infrastructure, which in turn affects sustainable development. The sum total of these indirect effects has negative influence on the level of sustainable development in Ogun State.

The structural equation equally shows that urban blight has a suppressing effect on sustainable development. The sum total of these is a positive influence on the level of sustainable development in Ogun State.

The coefficient of literacy in the structural equation is negative indicating that literacy level in Ogun State has a suppressing effect on the growth in the level of Sustainable development.

However, the totality of the indirect effect from the effect of level of literacy on the level of sustainable development which in turn affects investment in socioeconomic infrastructure which also affects the level of sustainable development, has a positive value. This shows that literacy level has an indirect positive effect on the level of sustainable development in the urban areas of Ogun State.

4.4 Findings on the Effect of urbanisation on Sustainable Development in Urban Areas of Oyo State.

The empirical results on our postulation on the constraints and driving force of sustainable development in the urban areas of Oyo State are presented in Tables 4.13 and 4.14.

In Table 4.13, the estimated coefficients, the values and diagnostics are all indicated. Tables 4.13 shows that for the period under study, developments in the incorporated variables explain more than ninety-nine percent of the variation in the level of growth in urban areas of Oyo State. Similarly, stability of the overall regression is highly significant (Appendix 12).

Table 4.13: Investment in Socioeconomic Infrastructure and Urbanisation – Oyo State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	11.53973	1.866689
<i>INV</i>	-0.068199	-1.888263
<i>URB(-1)</i>	0.992524	42.91893
<i>Adjusted R-squared</i>		0.990629
<i>Prob(F-statistic)</i>		0.000000

The result confirmed our a-priori expectation regarding the behaviour of the factors contributing to the growth in the level of urbanisation.

It shows that previous growth in the level of urbanisation is a major determinant of the current level of growth. This is statistically significant at one-percent level showing that previous level of growth of urban areas is a major driver of urbanisation in Oyo State.

However, the variable of investment in socioeconomic infrastructure is not significant implying that there is no evidence of contribution of investment in socioeconomic infrastructure to the growth of urbanisation in Oyo State

Table 4.14 indicates the estimated coefficients, the values and diagnostics. Table 4.14 shows that for the period under study, developments in the incorporated variables explain more than ninety-three percent of the systematic variation in the level of urban growth in Oyo State. Similarly, stability of the overall regression equation is highly significant. The Durbin-Watson is very good showing that the regression is free from serial correlation (Appendix 13).

Table 4.14: Quality of Life and Sustainable development in Urban Areas of Oyo State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	-9.238830	-0.864214
<i>INV</i>	0.010281	0.112415
<i>SD(-1)</i>	0.760948	2.884520
<i>BL</i>	0.169827	0.797130
<i>LIT</i>	-3.47E-05	-1.712541
<i>MI</i>	1.947439	1.598840
<i>D(LIT)</i>	2.14E-05	0.854663

Adjusted R-squared 0.919809

Prob(F-statistic) 0.000000

The result confirms our a-priori expectation regarding the effect of the previous level of sustainable development on current level of sustainable development. It shows a positive coefficient that is statistically significant at one percent.

This implies that for every ten-unit increase in previous level of sustainable development current level increases by eight units. It indicates that a period lag level of sustainable development is very crucial to attaining higher current level of sustainable development.

However, our a-priori expectation that urban blight is a significant contributor to the deterioration of level of sustainable development in the urban areas of Oyo State is not backed by empirical findings.

The variable of investment in socio-economic infrastructure shows no statistical significance indicating that there is no reliable evidence of contribution of investment in socio-economic infrastructure to sustainable development in the urban areas of Oyo State.

Table 4.14: Quality of Life and Sustainable development in Urban Areas of Oyo State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	-9.238830	-0.864214
INV	0.010281	0.112415
SD(-1)	0.760948	2.884520
BL	0.169827	0.797130
LIT	-3.47E-05	-1.712541
MI	1.947439	1.598840
D(LIT)	2.14E-05	0.854663
Adjusted R-squared 0.919809		
Prob(F-statistic) 0.000000		

The result confirms our a-priori expectation regarding the effect of the previous level of sustainable development on current level of sustainable development. It shows a positive coefficient that is statistically significant at one percent.

This implies that for every ten-unit increase in previous level of sustainable development current level increases by eight units. It indicates that a period lag level of sustainable development is very crucial to attaining higher current level of sustainable development.

However, our a-priori expectation that urban blight is a significant contributor to the deterioration of level of sustainable development in the urban areas of Oyo State is not backed by empirical findings.

The variable of investment in socio-economic infrastructure shows no statistical significance indicating that there is no reliable evidence of contribution of investment in socio-economic infrastructure to sustainable development in the urban areas of Oyo State.

This perhaps could also be attributed to the growing deterioration of socio-economic infrastructure in the state.

Similarly the coefficient of incidence of malnutrition is not significant suggesting that there is no reliable evidence that this variable has any perceptible impact on the level of sustainable development in Oyo State.

Similar to the findings on Ogun State, One pertinent aspect of our findings in Oyo State is the significant and negative coefficient of literacy variable in the urban areas of the state. This result confirms that increase literacy is a constraint to attaining high level of sustainable development in the urban areas of the State.

The result is buttressed by the insignificance of the variable of growth rate of literacy, which suggests that no categorical conclusion could be drawn regarding the effect of the growing rate of education on increasing the level of sustainable development in the urban areas of the State.

Realising that the t-value of the variable of investment in socioeconomic infrastructure on the level of Sustainable development is not significant (Table 4.14), we went further for conclusive evidence.

We test the relationship between urban economic growth and the role of investment in socioeconomic infrastructure in the urban areas of the State (Table 4.15).

The estimation of the parameter is carried out using an OLS procedure. This is done with an implicit assumption of unidirectional relationship between urban economic growth and the role of investment in socioeconomic infrastructure and one period lag of urban economic growth.

The equation reveals good results regarding R^2 , significant F-values, and significant t-values for both explanatory variables.

It shows that the regression explains over ninety-eight percent of the observed variation in the economic growth variable. Furthermore the stability of the overall regression is significant at one percent.

Therefore, the assumption of a log linear relationship between economic growth and the three explanatory variables is validated (Appendix 14).

Table 4.15: Investment in Socioeconomic Infrastructure and Urban Economic Growth – Oyo State.

<i>Variable</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	2.853752	2.393827
LOG(INVINC)	0.069839	1.564306
LOG(INC(-1))	0.989609	18.60526
LOG(BL)	-0.543999	-3.025350
<i>Adjusted R-squared</i>	0.983016	
<i>Prob(F-statistic)</i>	0.000000	

In the same vein, the result shows a positive relation between lag level of urban economic growth and current level. It is statistically significant at one-percent level.

This shows that the previous level of growth of urban economy in Oyo State is very crucial to attaining higher current level of economic growth. The findings show a negative coefficient for the variable of urban blight which is however not significant confirming our earlier findings regarding urban blight and sustainable development in Oyo State (Table 4.14).

In view of the fact that the coefficient of investment in socioeconomic infrastructure – economic growth ratio is statistically insignificant (Table 4.15), the result confirms the inconclusiveness of evidence regarding the role of investment in socioeconomic infrastructure on urban economic growth in Oyo State. This is an affirmation of the finding in Table 4.14 which shows that there is inconclusive evidence regarding the contribution of investment in socioeconomic infrastructure to the level of sustainable development in the urban areas of the State.

Table 4.16 shows the result of the effect of industrial growth on urban blight in the urban areas of Oyo State.

The estimated coefficients and the values and diagnostics are all indicated. It shows that for the period under study, the incorporated variables explain about twenty-five percent of the systematic variation in the level of urban blight in Oyo State. The stability of the overall regression equation is significant (Appendix 15).

Table 4.16: Industrial Growth and Urban blight – Oyo State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	96.36864	13.28412
<i>INGR</i>	-0.215812	-2.967007
<i>R-squared</i>		
	0.252941	
<i>Durbin-Watson statistic</i>		
	0.122230	

The result shows that industrial growth is a major inhibiting factor of urban blight in the State. The result is significant at one-percent level.

Our findings on the effect of population density on the level of Sustainable Development in Oyo State is very revealing (Table 4.17). The DW, the R^2 , F-value and t-values are all indicated and show good results.

The Table shows that for the period under study, developments in the incorporated variables explain more than eighty-one percent of the systematic variation in the level of sustainable development in the urban areas of the State. The stability of the overall regression equation is significant at one percent (Appendix 16).

Table 4.17: Population Density and Sustainable development – Oyo State.

Variables	Coefficient	t-Statistic
C	194.3949	8.016593
URB	-1.249424	-5.406312
URB ²	0.002290	4.438988
Adjusted R-squared 0.804379		
Durbin-Watson stat . 0.560577		

The test shows that the coefficients of the variables of population density and square of population density are both significant at one-percent level. The coefficient of the population variable is negative and that of the square of population density is positive. This shows that growing level of urbanisation is merely contributing to attaining increased level of sustainable development in the urban areas of Oyo State.

4.4.1 Indirect Effect of Predetermined Variables on Urbanisation and Sustainable Development in Oyo State.

The indirect effect of the predetermined variables on the variables of urbanisation, sustainable development and investment in socio-economic infrastructure is shown in Table 4.18.

Table 4.18 Indirect Effect of Predetermined Variables on Urbanisation and Sustainable development in Oyo State.

<i>Endogenous Variables</i>	<i>Predetermined Variables</i>					
	Urb_{t-1}	SD_{t-1}	BL_{t-1}	LIT_t	MI_t	ΔLIT_t
Urb_t	-0.80	-0.61	-0.137	2.5×10^{-5}	-1.57	-1.6×10^{-3}
SD_t	-0.98	-0.75	-0.168	3.1×10^{-5}	-1.93	-2.0×10^{-6}
INV_t	-0.054	-0.042	-0.009	1.7×10^{-6}	-0.107	-1.1×10^{-6}

Similar to the result in the urban areas of Lagos and Ogun States, the indirect effect of the lag growth level of urbanisation on the current growth level is negative.

This implies that an increase in the growth level of urbanisation from the effect of the lag level of urbanisation affects investment in socio-economic infrastructure, which in turn affects the growth level of urbanisation. The totality of these effects has a reducing effect on the growth of urbanisation.

From the findings in Table 4.17, the coefficient of the structural equation of the lag level of sustainable development on the current level is positive implying that lag level of Sustainable development has an elevating effect on the current level.

However, the increase in the current level arising from the effect of the lag level affects investment in socioeconomic infrastructure, which in turn affects the level of sustainable development. The totality of these effects on current level of Sustainable development is negative.

In the same vein, the direct effect of literacy on the level of sustainable development affects investment in socioeconomic infrastructure, which in turn affects the level of sustainable development. The sum total of these effects is an elevating effect on current level of Sustainable development.

4.5 Findings on the Effect of urbanisation on Sustainable Development in Urban Areas of Ondo State.

Tables 4.19 and 4.20 show the results on the estimate of the constraints and driving force of sustainable development in urban areas of Ondo State. The results indicate that for the period 1976-2004, developments in the incorporated variables in Table 4.19 explained more than seventy-seven percent of the systematic variation in level of sustainable development in the areas.

The estimated coefficients, the values and diagnostics are all indicated and show good results. The overall regression equation is very stable. The Durbin-Watson is very good showing that the regression is perfectly free from serial correlation (Appendix 17).

Table 4.19: Investment in Socioeconomic Infrastructure and Urbanisation – Ondo State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	35.52037	1.009244
<i>INV</i>	0.001224	0.196336
<i>URB(-1)</i>	0.818265	4.136390

Adjusted R-squared 0.756527

Prob(F-statistic) 0.000000

The result shows, as it was in the findings for urban areas of other three South-West States of Nigeria that previous growth in the level of urbanisation is a major determinant of the current urban growth in Ondo State.

This is statistically significant at one percent level implying that in the urban areas of Ondo State as well, previous growth level of urban areas is a major driver of current growth level of urbanisation.

However, the variable of investment in socioeconomic infrastructure is not significant, implying that there is no conclusive evidence to show that investment in socioeconomic infrastructure contributes to urbanisation in Ondo State similar to the findings in the urban areas of the other three States.

Table 4.20 presents the result of the effect of quality of life on the level of sustainable development in urban areas of Ondo State.

The regression shows that in the period under study, developments in the incorporated variables explain more than ninety-six percent of systematic variation in growth in the level of sustainable development in the urban areas of the State.

The F- value is significant at one-percent level indicating that there is a significant relationship between the six variables taken together and the level of sustainable development. The signs of all the coefficients are correctly indicated and three of the t-values are significant. The stability of the overall regression is also very good while the Durbin-Watson is plausible (Appendix 18).

Table 4.20: Quality of Life and Sustainable development – Ondo State.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	-10.40714	-0.838882
INV	0.004017	0.871292
SD(-1)	0.729760	8.908013
BL	0.809869	2.541356
LIT	-0.000307	-2.223168
MI	-1.583887	-2.134373
D(LIT)	0.000152	0.914353

Adjusted R-squared 0.954216

Prob(F-statistic) 0.000000

The coefficient of the lag level of sustainable development is significant at one percent level. This suggests that the previous level of Sustainable development is very germane to attaining higher current level of Sustainable development. And that for every one unit growth in the previous level, the current level is certain to increase by about two-third.

However, the variable of urban blight is not significant indicating that the role of urban blight in influencing the level of Sustainable Development is not obvious.

Furthermore, the variable of investment in socioeconomic infrastructure is not significant. This, as in the findings in the other three urban areas of South-West States of Nigeria shows that the role of investment in socioeconomic infrastructure in influencing the level of sustainable development in the urban areas of Ondo State is cloudy. This could be attributed to the significant cuts in investment in socio-economic infrastructure that were associated with SAP and other economic reform programmes.

Similarly the coefficients of the variables of child malnutrition and growth in literacy are correctly signed, they are however not significant, indicating that their roles in influencing the level of sustainable development are cloudy.

One major aspect of our findings with considerable implications for sustainable development in the urban areas of Ondo State is the insignificant coefficient of literacy level and change in the literacy level variables.

These findings have shown that increase literacy and growth of educational institutions are not effective contributors to attaining higher level of sustainable development in the urban areas of Ondo State.

This conforms to the conclusion of Akolade (2002) that in spite of many years of manpower planning, Nigeria's educational tragedy remains one of the major unresolved socioeconomic puzzles and a paradox in national development.

Given the non-significant coefficient of the investment in socioeconomic infrastructure variable on the level of Sustainable development, we test the

relationship between urban economic growth and the role of investment in socioeconomic infrastructure in the growth process.

This is done in order to generate conclusive evidence about the behaviour of investment in socioeconomic infrastructure in the process of urban economic growth in Ondo State (Table 4.21).

The estimated coefficients, the values and diagnostics are all indicated. The regression is able to explain over ninety-four percent of the observed variation in the urban economic growth variable. The stability of the overall regression (F-Statistics) is good.

Table 4.21: Investment in Socioeconomic Infrastructure and Urban Economic Growth – Ondo State

<i>Variable</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	3.444560	2.196931
LOG(INVINC)	-0.049459	-1.732809
LOG(INC(-1))	0.880386	11.30036
LOG(BL)	-0.584860	-1.461865
<i>Adjusted R-squared</i>	0.945920	
<i>Prob(F-statistic)</i>	0.000000	

The coefficient of the lag level of economic growth is correctly signed and significant at one-percent level. This finding as in the other three South-West States affirms the dependency of current urban economic growth on the previous level economic growth.

The variable of the role of investment in socioeconomic infrastructure on urban economic growth is not significant.

This confirms our earlier findings (Table 4.20) that the role of investment in socioeconomic infrastructure in the economic growth process of urban areas of Ondo State is very cloudy.

One interesting aspect of our findings in the urban areas of the South-West States of Nigeria is related to the poor contribution of investment in socioeconomic infrastructure to urban economic growth while previous level of urban economic growth is a major factor in enhancing future growth in the areas.

This particular finding is pertinent because of the failure of government to provide socioeconomic infrastructure. This has led many private businesses to provide the infrastructure themselves. In fact, the study of Lee and Anas (1992), shows that most businesses in Nigeria incur extra cost to provide their own roads, hospitals, security, water, electricity and telecommunication facilities.

The effect of the variable of urban blight in urban economic growth process of urban areas of Ondo State is not conclusive because of the insignificance of the coefficient of urban blight in the regression equation (Table 4.21)

Findings on the effect of industrial growth on growth of urban blight in Ondo State are statistically not significant (Table 4.22; Appendix 20).

population density are both significant at one-percent level. Secondly, while the coefficient of the population density variable is negative, that of the square of population density is positive implying a growing contribution of urbanisation to sustainable Development in the urban areas of the State.

4.5.1 Indirect Effect of Predetermined Variables on Urbanisation and Sustainable Development In Ondo State

The indirect effect of the predetermined variables on urbanisation, sustainable development and investment in socioeconomic infrastructure is presented in Table 4.24

Table 4.24 Indirect Effect of Predetermined Variables on Urbanisation and Sustainable development in Ondo State.

<i>Endogenous Variables</i>	<i>Predetermined Variables</i>					
	Urb_{t-1}	SD_{t-1}	BL_{t-1}	LIT_t	MI_t	ΔLIT_t
Urb_t	-0.82	-0.73	-0.812	3.1×10^{-4}	1.587	-1.5×10^{-4}
SD_t	-0.816	-0.728	-0.808	3.1×10^{-4}	1.579	-1.5×10^{-4}
INV_t	0.0043	0.00382	0.0042	1.6×10^{-6}	-0.0083	-7.8×10^{-7}

The Table 4.24 above shows that the indirect effects of lag growth level of urbanisation on the current growth level makes the current growth level to affect investment in socio-economic infrastructure which in turn negatively affects the current growth level of urbanisation.

Similarly, the positive impact of the lag level of sustainable development on the current level (Table 4.23) makes the current level to affect investment in socio-economic infrastructure, which in turn re-affects the current level of sustainable development. The sum total of these effects has reducing effect on the level of sustainable development.

4.6 Findings on the Effect of Urbanisation on Sustainable Development in Urban South-West Nigeria.

The empirical results of our postulation on the constraints and driving force of sustainable development in the urban areas of South-West Nigeria are presented in Table 4.25 and 4.26 respectively.

In Table 4.25, the estimated coefficients the values and diagnostics are all indicated. Table 4.25 shows that for the period under study, development in the incorporated variable explain more that ninety-nine percent variations in the growth level of urban areas in South-West Nigeria. Similarly, the stability of the overall regression is highly significant (Appendix 22).

Table 4.25: Investment in Socio-economic Infrastructure and Urbanisation – South-West Nigeria.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	74.19747	1.579357
<i>INV</i>	-0.004759	-0.564482
<i>URB(-1)</i>	1.026836	46.23355
<i>Adjusted R-squared</i>	0.994933	
<i>Prob(F-statistic)</i>	0.000000	

Similarly to findings in the States of South-West Nigeria, the result shows that previous level of urbanisation is a major driver of urbanisation in the region.

However, the variable of investment in socio-economic infrastructure shows no evidence of palpable contribution to the process of urbanisation in the region.

Table 4.26 presents the result of the effect of quality of life of urban dwellers on the level of sustainable development in the region. The regression shows that in the period under study, developments in the

incorporated variables explain more than eighty-nine percent of observed variation in the growth in the level of growth of sustainable development in the region (Appendix 23).

The F-value is significant at one percent level indicating that there is a significant relationship between the six variables taken together and the level of sustainable development.

Table 4.26: Quality of Life and Sustainable Development –South-West Nigeria.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
<i>C</i>	-77.67007	-0.895088
<i>INV</i>	0.000291	0.188977
<i>SD(-1)</i>	0.660709	4.301309
<i>BL</i>	0.344929	1.385109
<i>LIT</i>	-5.60E-05	-1.658141
<i>MI</i>	1.422200	1.232383
<i>D(LIT)</i>	2.71E-05	0.726598
<i>Adjusted R-squared</i>	0.893248	
<i>Prob(F-statistic)</i>	0.000000	

While a number of the coefficients of the variables are not significant, the coefficient of the lag level of sustainable development is positive and significant at one percent level suggesting that the lag level of sustainable development is a major driver of the current level. It shows that for every unit increase in the lag level, the current level is expected to increase by more than half a unit.

One revealing aspect of our findings is the insignificant coefficients of literacy and growth in literacy. This affirms that in urban South-West Nigeria, the contribution of education to sustainable development, is low and that little conclusion can be drawn on the effect of education on increased attainment of Sustainable development.

The equation reveals good results regarding R^2 , significant F-values, and significant t-values for both explanatory variables.

It shows that the regression explains over ninety-five percent of the observed variation in the economic growth variable. Furthermore the stability of the overall regression is significant at one percent.

Therefore, the assumption of a log linear relationship between economic growth and the three explanatory variables is validated (Appendix 24).

Table 4.27: Investment in Socioeconomic Infrastructure and Urban Economic Growth – South-West Nigeria.

<i>Variable</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	13.34563	10.44423
LOG(INV/INC)	-0.328458	-9.903833
LOG(INC(-1))	0.409927	5.263366
LOG(BL)	-1.437303	-9.951466
<i>Adjusted R-squared</i>	0.953708	
<i>Prob(F-statistic)</i>	0.000000	

In the same vein, the result shows a positive relation between lag level of urban economic growth and current level. It is statistically significant at one-percent level.

This shows that the previous level of growth of urban economy in South-West Nigeria is very crucial to attaining higher current level of economic growth. The findings show a negative coefficient for the variable of urban blight which is also significant confirming our earlier findings regarding urban blight and sustainable development in South-West Nigeria (Table 4.26).

The estimated coefficients, the values and diagnostics are all indicated. It shows that for the period under study, the incorporated variables explain over fifty-percent of the observed variations in the level of urban blight in the region. The stability of the overall regression equation is equally stable (Appendix 25)

Table 4.28: Industrial Growth and Urban Blight – South-West Nigeria.

<i>Variable</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	444.0059	13.60088
INGR	-0.41260	-5.351682
R-squared	0.524163	
S.E. of regression	40.28024	
F-statistic	28.64050	
Prob(F-statistic)	0.000013	

The result shows that industrial growth is a major inhibiting factor of urban blight in the region. The result is significant at one percent level.

Our finding on the effect of population density on the level of sustainable development in South-West Nigeria is very interesting (Table 4.29).

The estimated coefficients, the values and diagnostics are all indicated (Appendix 26). Table 4.29 shows that for the period under study, developments in the incorporated variables explain more than ninety percent of the systematic variations in the level of sustainable development in the region. Equally, the stability of the overall regression equation is highly significant.

Table 4.29: Population Density and Sustainable Development -South-West Nigeria.

<i>Variables</i>	<i>Coefficient</i>	<i>t-Statistic</i>
C	329.7522	27.86074
URB	0.148225	5.182854
URB ²	-0.189368	-6.812026
S.E. of regression	20.16367	
Prob(F-statistic)	0.000000	

The result shows that growing level of urbanisation in South-West Nigeria is major driver of sustainable development in South-West Nigeria as a region.

4.6.1 Indirect Effect of Predetermined Variables on Urbanisation and Sustainable Development In South-West Nigeria.

The indirect effects of change in the predetermined variables on the variables of urbanisation sustainable developed and investment in social economic infrastructure in urban South-West Nigeria is presented in table 4.30.

Table 4.30 Indirect Effect of Predetermined Variables on Urbanisation and Sustainable Development in South-West Nigeria

<i>Endogenous Variables</i>	<i>Predetermined Variables</i>					
	Urb_{t-1}	SD_{t-1}	BL_{t-1}	LIT_t	MI_t	ΔLIT_t
Urb_t	-0.1.03	-0.66	-0.35	5.6×10^{-5}	-1.43	-2.7×10^{-5}
SD_t	-1.05	-0.68	-0.33	5.5×10^{-5}	-1.42	-2.64×10^{-5}
INV_t	0.004	2.6×10^{-5}	1.9×10^{-3}	2.6×10^{-3}	6.4×10^{-3}	-1.2×10^{-7}

Considering the variables that are significant from the structural parameter, the lag of growth level of urbanisation does increase current growth of urbanisation. In the same view, the effect of the lag growth level of urbanisation on current level of urbanisation also affects investment in socio economic infrastructure, which consequently affects growth of urbanisation. The indirect effect of lag growth level on current level of urbanisation through this process is negative. This implies that the indirect effect of lag growth level of urbanisation does actually suppress the current level of urbanisation.

Similarly the direct effects of the lag level of sustainable development affect the current level, and the increase the magnitude of the current level affects investment in socio-economic infrastructure, which in turn negatively affects the current level of sustainable development.

4.7 General Discussion of Findings

One of the most important demographic phenomena that promises to loom even larger in the South-West Nigeria of the future is the rate of urban growth.

A central question relating to the growth of urban South-West Nigeria is how it will cope economically and socially and still retain the quality of its environment with acute concentration of people.

In other words, an integral part of urban development entails improvement in the quality of living of urban dwellers, their income, quality of education, sanitation, public health and general well being.

The central question therefore is how will the growing concentration of people in urban South-West Nigeria be made to contribute to the realisation of goals of development today and in the future.

Therefore, the critical issue that needs to be addressed in urban South-West Nigeria is the extent to which policies which have definite impact on the trends of urbanisation in the area can be formulated.

It is clear that the pursuit of economic development strategies and reforms emphasise technological sophistication and industrial modernisation to create opportunities. But a substantial proportion of the affected sectors in South-West Nigeria is located in the urban areas of the region. This

contributes significantly to the growing trend of urban growth in South-West Nigeria.

Our study has shown that in spite of the long history of urbanisation in South-West Nigeria, the area has not been successful in the management of urban blight.

Although there is considerable decline in urban blight at the later period of the study, there is still considerable need to eliminate urban blight in order to improve the quality of life of the people of the urban areas of the region. This is because urban blight poses considerable challenges to the health and sanitation of urban dwellers and to improving live-in environment in urban areas.

Since one of the major causes of urban blight in South-West Nigeria is poor availability of adequate refuse disposal system, there is an urgent need for investment in this regard.

Similarly, given that inadequate toilet facilities and single room households are contributory to the problem of urban blight, there is a need for concerted government effort at promoting order in urban development. One way of achieving this is to restrict rural-urban migration. This is the approach that enhances live-in environment in Beijing, China.

It is obvious that South-West urban areas exhibit visible symptoms of lack of planning. In most cases, new areas are built before proper lay-outs and roads are put in place. Houses are built without approved Building Plans and rules governing set-back of houses from roads and drainage alignments are never kept

There is also the need to enhance proper facilitation and construction of public utility services, housing, transport and other public services in addition to conserving and developing the environmental resources of urban areas of the region.

Efforts in this direction need to identify and avert institutional bottlenecks, which gives rise to poor investment in waste management and real estate in the area.

The level of sustainable development in the urban areas of South-West Nigeria is declining. This is an indication of growing decline in real income, growing level of unemployment and growing deterioration of urban environmental quality.

One pertinent lesson of our findings in respect of the trends of sustainable development in the urban areas of South-West Nigeria is the palpable rise in sustainable development trends in the agrarian States of Ogun, Oyo and Ondo States.

This shows that urban income and employment and even environment quality are closely linked to the strength of the agricultural economy of the region and that quality of life in these urban areas can be improved by strengthening the agricultural economy of South-West Nigeria.

Since control of growth of urban areas in South-West Nigeria has been problematic with respect to regulation needed to improve quality of life in these areas, there is need to ensure that services provision keep up with growing urbanisation.

There is also the need to strictly enforce environmental improvement laws so that rising level of urban growth in the area can be strongly associated with improving level of Sustainable development.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

We have been keen to discuss the major urban environment issues that are germane to the realisation of rapid sustainable development of urban South-West Nigeria. A basic issue to be addressed in is why the effect of deterioration in quality of urban life continues to impose severe losses on the socio-economic well being of urban inhabitants in South-West Nigeria despite the comprehensive environmental policy of government. Another preliminary matter, which needs to be settled, is to identify indices that can appropriately capture the interaction of environment and development in South-West Nigeria.

After the introductory chapter, we move to review relevant literature on issues concerning urbanisation and sustainable development. This is done with the aim of synthesizing the salient features already established in the literature and consider any critical issues that are not properly addressed. We begin with the examination of the literature on momentum and models of urbanisation and economic growth, their established shortcomings and implications for the environment and sustainable development.

We identify three unique features of urbanisation in South-West Nigeria which are incorporated into the analytical framework of our models. We identify these features as investment in socio-economic infrastructure, urban economic growth, and quality of life of the people and the environment as having very powerful leverage over urbanisation. We also select indicators of Sustainable development based on work programme of the United Nations Commission on Sustainable Development. We adapted

our indices of urban blight and sustainable development from the Physical Quality of Life Index (PQLI).

We move to an empirical investigation of the effect of urbanisation on Sustainable development in South-West Nigeria.

We begin by treating the relationship between urbanisation and sustainable development as a system of simultaneous equation and employ the two-stage least square (2SLS) econometric technique to obtain the estimates of the structural parameters. We also expressed the structural model in the reduced form parameter in order to measure the direct and indirect effect of a change in the predetermined variables on the endogenous variables.

We analyse the trends of urban blight and sustainable development in South-West Nigeria. We notice that the trend of urban blight is high at the early period of our study but fell at the later period. We also notice a palpable rise in the trend of sustainable development at the height of the Structural Adjustment Programme (SAP) among the agrarian states of South-West Nigeria.

Our empirical findings show that a major driver of urbanisation in South-West Nigeria is the previous level of urbanisation. However, there is no empirical evidence to conclude that level of urbanisation in South-West Nigeria is being driven by investment in socio-economic infrastructure.

Similarly our findings show that while the previous level of urban income and sustainable development are major determinants of the current levels, urban blight is a major inhibiting factor to the process of sustainable development in the region. Moreover, our findings with respect to literacy and growth rate of literacy shows no categorical conclusion in respect of the effect of education on the attainment of sustainable development in the

urban areas of the region. In this regard, the consequent lack of statistical significance of literacy and growth rate of literacy shows that these variables are hardly contributing to inducing the growth of sustainable development in the region.

Arising from our findings, policy measures which needs to be implemented to achieve and promote sustainable development in the face of growing urbanisation in South-West Nigeria are then discussed.

By so doing and provided the recommended policies and measures are implemented, one can reasonably expect a surge in the sustainable development of urban South-West Nigeria in the years ahead.

5.2 Conclusion

The growth of urban areas of South-West Nigeria has been recognised as the kinetic force that propels the economic growth of the Nigerian nation and it is expected to serve this role for a long time to come.

However, the nature of urban growth poses considerable cause for concern because the economic growth arising therefrom is much at the expense of future development.

By so doing, future economic growth and development, both in urban South-West Nigeria and Nigeria, are put in jeopardy.

This is because the movement of people to urban areas continues unabated due to socioeconomic and demographic forces which are likely to drive the growth of urban areas in South-West Nigeria into unsustainable levels.

In urban South-West Nigeria, government appeared unprepared and ill equipped to provide the influx of new residents with viable and critically required infrastructure. The resulting burgeoning population density rapidly overwhelm whatever facilities exist and subject the urban inhabitants to environmental nightmares by denying a large number of the inhabitants the most basic facilities and services.

Unfortunately, investment in socioeconomic infrastructure plays very poor roles in the urbanisation process as well as the economic growth process.

It also enhances negative effect of urban blight on urban economic growth of the area.

In the light of these, and the debilitating nature of infrastructure in the areas, there is a need for urgent initiatives to improve the level of investment in socio-economic infrastructure. This will enhance the quality of life of the urban inhabitants and reduce the dependence of the current level of economic growth on the resources required for future development.

Such initiative should be founded on a well articulated urban renewal programme which takes cognizance of the imperatives of urban economic growth, qualitative human capital development, employment generation, social services and environmental improvement in the area.

For urbanisation in South-West Nigeria to be an effective strategy of development, and account for an increased share of national income, there is a need for strong linkage between it, level of economic and human development and environmental improvement.

This will ensure that goods and services are generally produced more efficiently since there will be access to a pool of labour with appropriate skills, supporting services as well as transport and communication links.

No doubt, quality of human capital is a crucial determinant of the economic growth process. It is a commonplace that areas with better-educated people are more likely to enhance their quality of life and income. Highly educated people are more innovative and easily adapt to new technology, thus, improving the efficiency of physical capital and human productivity.

By so doing, there is an urgent need for government attention on qualitative education with particular emphasis on educational infrastructure.

5.3 Policy Recommendations In Respect of Urbanisation and Sustainable Development In Urban Areas of Lagos State

One unique aspect of urban agglomeration in Lagos state is the unmatched nature of its economic activities both in Nigeria and the West Africa sub-region. As a result, the area of its economic influence extends beyond Nigeria to Africa and probably beyond.

The implication of this is enormous, given the fact of our findings, which shows that previous level of urbanisation is a major driver of current level of urbanisation in the State. It implies that the urban areas of Lagos state may grow to become one of the largest mega-cities in the world. Already, the city of Lagos itself is currently the sixth largest city in the world.

On the other hand, our findings have emerged with negligible evidence of contribution of investment in socioeconomic infrastructure to the process of urbanisation in Lagos state. This indeed negates some of the theories of urban growth whose plank is that lack of socioeconomic infrastructure in the rural areas is the principal push factor of urbanisation while the availability of these infrastructures in the urban areas is the pull factor which pull the migrants into urban areas.

Evidence from the findings has also shown that past level of sustainable Development drives current level of sustainable Development.

The immediate policy implication is that stimulant for generating economic growth with respect to provision of basic goods and services such as power, petroleum products, cheap tele-communication, infrastructures and physical capital must be provided. Land laws, property rights and tax structure are policy instruments that must be strengthened in this regard. And entrepreneurs must be made to have improved access to technology and markets as well as auxiliary incentives to increase output and income.

These are vital to enhancing sustainable development that is not hampered by growing urban blight. It is also vital to enhancing rapid industrial growth that are required to push down the level of urban blight in Lagos State.

This is because there is poor level of waste management in urban areas of the State with many of its areas turned into slums. By so doing, the urban areas of Lagos State are characterised by high level of congestion, stinking drains and uncleared solid and non-solid waste including human wastes and a large number of persons per room with high level of unemployment and urban poverty.

Sustainable development in the urban areas of the State can also be enhanced through improving the quality of education. Our findings have shown that the contribution of education to sustainable development in the urban areas of the State is not palpable despite the growth of educational institutions in the State over the years. This is because the necessary and required facilities and incentives to enhance human resources development are generally lacking.

An important lesson of our study is that a conducive economic setting is required at all times in the urban areas of the state if economic growth must be sustained. Such environment must guarantee efficient allocation of resources, provide appropriate signals to the productive sectors and eliminate biases and distortions in production, investment and consumption. This is because current economic growth is a major driver of future growth of urban economy of Lagos State.

Finally, the study highlights the problem of a possible over-urbanisation in the urban area of Lagos State. It shows that the growth of urban areas in the State may surpass the maximum carrying capacity with respect to sustainable development and any future growth of urban areas in the State may drive down the level of sustainable development. By so doing, there is the need to curtail the threat of possible over-urbanisation of the urban areas of the State so as to ensure that present economic growth in these areas does not hamper future development

5.4 Policy Recommendations in Respect of Urbanisation and Sustainable Development In Urban Areas Of Ogun State

A major implication of urbanisation in Ogun State is that future growth of urban areas is dependent on the current growth level of urbanisation.

This implication is daunting because the growth of urban areas imposes significant short and long-term costs, which government may not be willing or able to consider.

This evidence is also a major cause for concern because the contribution of investment in socioeconomic infrastructure is not an important driver of urbanisation in Ogun State.

In essence, the implication is that with or without access to adequate waste management and improved quality of life and the environment, the growth of urbanisation will not be hampered.

By so doing, and in order to enhance the quality of life of urban inhabitants, it is incumbent on the government to ensure adequate provision of socio-economic infrastructures, as growth of urbanisation in Ogun State cannot be halted even without it.

One major lesson of our study is that for development to remain sustainable in the urban areas of Ogun State the adverse environmental cost of production and consumption must be managed.

There will be the need to improve provision of urban environmental services with respect to drainage, sanitation, waste collection and adequate supply of drinking water. In addition to providing conducive environment for economic growth and greater employment generation.

This will ensure that current growth and future development is not constrained by growing urban blight in the area.

Furthermore urban blight can be curtailed by providing the enabling environment and macroeconomic stability for industrial growth and development.

Our study has highlighted the futility of growing educational expansion without consideration for any element of quality.

Thus, there is a need for re-evaluation of educational policy in the urban areas of Ogun state so that it will not continue to contribute negatively to economic growth, social progress and environmental quality. Such re-

evaluation will be required to enhance people's knowledge, broaden skills and improve public health, thereby constituting to raising living standard and enriching people's life.

While the urban areas of Ogun State have considerable roles to play in the economic development of the State, they are also characterised by rapid social changes, which can exert adverse consequences on urban inhabitants. Such changes are associated not just with shifting composition of urban cournubation but also with lack of economic opportunities.

By so doing, there is the need to strength the economic development policy of the State government to enhance continuous economic growth as current growth of the urban economy of Ogun state is very crucial to attaining future urban economic growth in the State.

Finally, our study has shown that there is a marginal impact of increased level of urbanisation on the level of sustainable development in urban areas of Ogun State. This shows that urbanisation needs to be properly managed for sustainable development to be enhanced in the State and by so doing; policy to enhance the quality of life of urban inhabitants needs to be strengthened.

5.5 Policy Recommendations in Respect of Urbanisation and Sustainable Development In Urban Areas Of Oyo State

There is no denying that urban population growth is largely affected by other demographic factors. These factors include the level of fertility, rate of mortality and level of well being. But the implication of the relationship between urban population and demography in Oyo State is obvious given the fact that current growth level of urbanisation in the state is a major

driver of future growth of urbanisation. This implies that the level of fertility can be expected to grow in the area.

Similarly, growing poverty and hunger, malnutrition and general deprivation may raise the rate of mortality and reduce the level of well being.

The reality of this is clear given the lack of evidence of contribution of investment in socio-economic infrastructure to urbanisation in the urban areas of the State.

Similarly, in the urban areas of Oyo State, our findings have shown that current level of sustainable development is a major enhancing factor of future level of sustainable development.

This implies a very strong link between urbanisation and levels of economic and human development in the areas. It shows the imperative of ensuring efficient production of goods and services by providing access to appropriate skills acquisition, providing supporting services, transport and communication link and reducing possible environmental degradation in the pursuit of production and consumption activities.

Similarly, industrial growth can be enhanced through fiscal and other policy so that the level of sustainable development will not only be enhanced but urban blight, which is a by-product of urban environmental degradation can be curtailed.

One disturbing aspect of our findings with respect to the urban areas of Oyo State is that, similar to our findings with regards to the urban areas of Ogun State, increase literacy is a constraint to Sustainable Development in the area.

Unfortunately, education is an important element in the development of human capital required to achieve and sustain rapid economic growth and development.

Presently, in the urban areas of Oyo State, like in many other States of South-West Nigeria, many schools lack teaching aids, equipment, appropriate textbooks, and furniture. Schools equally suffer from overcrowding, poor sanitation, poor quality teaching and poor quality products.

Therefore, there is a need for complete overhauling of educational policy of government in urban areas of the State so that the goals of education in terms of economic growth and development can be realised.

This general and complete overhauling of educational policy is imperative because current urban economic growth in urban areas of the State is a sine-qua-non to future economic growth of urban areas in the state.

Given that growing level of urbanisation is inevitable since urbanisation in the state is independent of investment in socio-economic infrastructure, urban economic growth must be sustained so that quality of life in urban areas of the state can be enhanced.

Interestingly, our findings have shown that a growing level of urbanisation in Oyo State can marginally contribute to attaining higher level of sustainable development. In view of this, policy must be directed at removing all identifiable constraints of economic growth and sustainable development so that quality of life of the urban inhabitants of the state can be enhanced.

5.6 Policy Recommendations in Respect of Urbanisation and Sustainable Development In Urban Areas Of Ondo State

There is no denying the fact that one of the critical issues of development today is urbanisation, which is an inevitable result of industrialisation. However, urbanisation leads to explosion in the demand for urban social services and diversion of funds for provision of social amenities.

This implies that in the urban areas of Ondo State, future explosion in the urban social amenities can be expected given the fact that current growth level of urbanisation is a major driver of urbanisation in the state.

In essence, provision of adequate social services and investment in socio-economic infrastructure can be key strategy for enhancing sustainable development in the state.

Given a possible excruciating effect of such investment on government resources, it may rely more on the private sector to finance and manage some of these services.

Adequate and improved social services and infrastructure will lead to more income earnings opportunities both within and outside the urban communities and release investible funds for provision of electricity, roads, water, schools, and health facilities. It could also result in new investment to create additional jobs to reduce unemployment.

It will as well enhance industrial expansion and development, which will simultaneously reduce urban blight and improve the level of sustainable development.

Such approach is crucial because of the fact that current level of economic growth is a sine-qua-non for future economic growth in the urban areas of

the state. Similarly, growing level of sustainable development does actually contribute significantly to attaining higher level of sustainable development in the urban areas of the state in future.

5.7 Policy Recommendations in Respect of Urbanisation and Sustainable Development In Urban South-West Nigeria

There is no doubt that urban areas of South-West Nigeria have considerable role to play in the economic development of the region and Nigeria in general.

However, they are characterised by rapid social changes arising from the strong impact of previous growth level of urbanisation on current level. This strongly implies a strong economic, social, and cultural linkage between the urban areas of South-West Nigeria and its rural areas.

By so doing, it will be out of place to put any urban policy in place in isolation of the rural areas. The consequences of such isolated policy in the rural areas may be complex and unpleasant.

Therefore, conditions in the rural areas must be considered in formulating policy to stem the momentum of urbanisation in South-West Nigeria especially in Lagos State where there is a possible threat of over-urbanisation.

Disintegrating infrastructure and living condition are some of the most visible problems of urbanisation in South-West Nigeria.

Rehabilitation of urban infrastructure is very urgent in all the urban areas of South-West Nigeria. While conditions in the capital cities are bad, matters are typically worse in secondary cities.

Unfortunately, infrastructural rehabilitation needs are so vast and the resources of government are so stunted that it may be necessary to concentrate on basic infrastructural services while considering private sector participation in provision of some other infrastructures.

One interesting aspect of our findings about the effect of urbanisation on sustainable development in South-West Nigeria is that previous level of Sustainable development is a driving force of future level of Sustainable development.

The immediate policy implication is that unless environmental degradation issues are tackled earlier, the growing momentum of urbanisation and its accompanying human economic activities will irreversibly damage the environment of urban south-west Nigeria.

Other policy implication is that the restricted access to qualitative education, differential access to credit between the formal and informal sector, and forces that make it difficult for non-indigenes to enter career that permit upward mobility in other South-West States need to be combated.

Fiscal and other policy to enhance industrialisation must be vigorously pursued.

One revealing aspect of our findings is that educational expansion does lead to deterioration in level of sustainable development in some urban areas of South-West Nigeria. This is a major socio-economic tragedy and paradox in development. A number of factors have been adduced for this.

First, manpower planning in South-West Nigeria has centred around the projection and effecting changes in the size of enrolment in primary, secondary, and tertiary institutions.

Second, political exigencies have forced government to rapidly change educational policy and system.

Third, the goal of employment generation that has always been professed by the government is never attained. By so doing, the rapid development in general education and vocational skills has not been matched by employment opportunities.

This shows that growing investment in education is not a sufficient solution to urban unemployment problem.

This study has shown that the traditional approach to solving urban unemployment problem through huge investment in education can result in paradoxical situation where more educational investment leads to higher level of urban unemployment.

This has important implication for curtailing investment in excessive educational expansion without consideration for quality.

This is more so because, as employment opportunities become scarce, there will be tendency for employers to use educational attainment as rationing devices. This will lead to more pressure on people to seek higher qualifications since demand for education is a derived demand for employment.

Finally, one implication of our findings is that the previous level of income in urban South-West Nigeria is crucial to attaining higher level of income in

the future. Interestingly, there has been considerable controversy over the robustness of income as a measure of development. The major reason for this controversy is the failure of income to reflect welfare consideration.

But with our findings, there will be need to re-evaluate a number of government strategies formulated to combat poverty and improve liveability in the urban areas of the region.

First, is the World Bank (1996a,b) two fold strategies of poverty reduction. It involves strategy on efficient labour intensive growth based on appropriate market incentives, physical infrastructure, institutions and technological innovation.

The second strategy being adequate provision of social services including primary education, basic health care and family planning services.

These two strategies have not shown much inclination towards direct intervention in the level of income of the people.

But our findings have shown that until a direct intervention in the level of income is undertaken, future income in the urban areas of south-west Nigeria will be jeopardised by the low current level of income of the people.

Moreover, government in south-west Nigeria have variously and sometimes vigorously implement urban renewal policy and programmes to improve liveability and environmental quality through improved sanitation and aesthetic condition.

Our study has shown that until conscious effort is made at improving the income of the people, these policy and programmes would be subverted given the low level of income of the people.

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Appendix 1. Estimated and Projected Volumes (m³) of Solid Waste Generation in Some South-West Nigerian Cities.

Urban Areas	1980	1985	1990	1995	2000	2005	2010
Lagos	625399	681394	786079	876829	998081	1087896	1272553
Ibadan	350823	38222	440956	449586	559882	626468	723849
Abeokuta	210935	229821	265129	302414	352853	389959	450593
Akure	99871	111905	135272	159458	197660	219734	252619
Osogbo	131903	143712	173720	217787	253841	278686	313904

Source: *Adapted from: The State of the Environment, Monograph Series, No.3. Federal Ministry of Environment Abuja (no date).*

Appendix 2. Investment in Socioeconomic Infrastructure and Urbanisation- Lagos State

Dependent Variable: URB
 Method: Two-Stage Least Squares
 Date: 02/14/06 Time: 21:24
 Sample(adjusted): 1978 2004
 Included observations: 27 after adjusting endpoints
 Instrument list: BL INV(-1) C URB(-1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-245.2056	305.0869	-0.803724	0.4294
INV	2.118650	1.887677	1.122358	0.2728
URB(-1)	1.070995	0.058847	18.19954	0.0000
R-squared	0.983222	Mean dependent var	2360.815	
Adjusted R-squared	0.981823	S.D. dependent var	1080.367	
S.E. of regression	145.6554	Sum squared resid	509172.0	
F-statistic	712.0310	Durbin-Watson stat	1.314957	
Prob(F-statistic)	0.000000			

Appendix 3. Quality of Life and Sustainable Development -Lagos State.

Dependent Variable: SD
Method: Two-Stage Least Squares
Date: 02/01/06 Time: 15:29
Sample(adjusted): 1978 2004
Included observations: 27 after adjusting endpoints
Instrument list: INF C INV(-1) SD(-1) BL LIT MI D(LIT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.958848	4.616416	-0.640507	0.5291
INV	0.024744	0.022506	1.099447	0.2846
SD(-1)	0.845417	0.067259	12.56961	0.0000
BL	-0.075929	0.027969	-2.714745	0.0133
LIT	4.34E-07	6.16E-06	0.070385	0.9446
MI	2.800692	1.029648	2.720048	0.0132
D(LIT)	-4.77E-07	6.13E-06	-0.077859	0.9387
R-squared	0.966583	Mean dependent var	40.62296	
Adjusted R-squared	0.956558	S.D. dependent var	10.66302	
S.E. of regression	2.222472	Sum squared resid	98.78767	
F-statistic	95.66264	Durbin-Watson stat	1.643493	
Prob(F-statistic)	0.000000			

Appendix 4. Investment in Socioeconomic Infrastructure and urban Economic Growth- Lagos State

Dependent Variable: LOG(INC)

Method: Least Squares

Date: 08/18/07 Time: 09:11

Sample(adjusted): 1978 2003

Included observations: 26 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.683539	0.508379	1.344547	0.1925
LOG(INVINC)	0.002524	0.018448	0.138819	0.8924
LOG(INC(-1))	0.941030	0.054662	17.21546	0.0000
LOG(BL)	-0.045068	0.013998	-3.219574	0.0039
R-squared	0.931658	Mean dependent var	8.984755	
Adjusted R-squared	0.922336	S.D. dependent var	0.216288	
S.E. of regression	0.060275	Akaike info criterion	-2.639161	
Sum squared resid	0.079928	Schwarz criterion	-2.445608	
Log likelihood	38.30909	F-statistic	99.96697	
Durbin-Watson stat	1.721694	Prob(F-statistic)	0.000000	

Appendix 5. Industrial Growth and Urban Blight – Lagos State.

Dependent Variable: BL
Method: Least Squares
Date: 02/01/06 Time: 19:40
Sample: 1977 2004
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	127.9845	15.33188	8.347614	0.0000
INGR	-0.392044	0.066501	-5.895273	0.0000
R-squared	0.572046	Mean dependent var	40.26464	
Adjusted R-squared	0.555587	S.D. dependent var	29.33752	
S.E. of regression	19.55767	Akaike info criterion	8.853361	
Sum squared resid	9945.060	Schwarz criterion	8.948518	
Log likelihood	-121.9471	F-statistic	34.75424	
Durbin-Watson stat	0.261146	Prob(F-statistic)	0.000003	

Appendix 6. Population Density and Sustainable Development – Lagos State.

Dependent Variable: SD
 Method: Least Squares
 Date: 02/01/06 Time: 19:43
 Sample: 1977 2004
 Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	87.50762	5.693606	15.36945	0.0000
URB	-0.039601	0.005823	-6.800498	0.0000
URB ²	7.00E-06	1.25E-06	5.588518	0.0000
R-squared	0.784055	Mean dependent var	41.52286	
Adjusted R-squared	0.766779	S.D. dependent var	11.49624	
S.E. of regression	5.551874	Akaike info criterion	6.367105	
Sum squared resid	770.5825	Schwarz criterion	6.509841	
Log likelihood	-86.13947	F-statistic	45.38504	
Durbin-Watson stat	0.249541	Prob(F-statistic)	0.000000	

Appendix 7. Investment in Socioeconomic Infrastructure and Urbanisation – Ogun State

Dependent Variable: URB
 Method: Two-Stage Least Squares
 Date: 01/28/06 Time: 09:25
 Sample(adjusted): 1978 2004
 Included observations: 27 after adjusting endpoints
 Instrument list: BL INV(-1) C URB(-1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	19.09461	12.38875	1.541286	0.1363
INV	-0.300641	0.300120	-1.001738	0.3265
URB(-1)	0.968637	0.044204	21.91280	0.0000
R-squared	0.988258	Mean dependent var	178.3704	
Adjusted R-squared	0.987280	S.D. dependent var	75.78723	
S.E. of regression	8.547638	Sum squared resid	1753.491	
F-statistic	1009.495	Durbin-Watson stat	2.838740	
Prob(F-statistic)	0.000000			

Appendix 8. Quality of Life and Sustainable Development in Ogun State.

Dependent Variable: SD
Method: Two-Stage Least Squares
Date: 01/28/06 Time: 09:06
Sample(adjusted): 1978 2004
Included observations: 27 after adjusting endpoints
Instrument list: INF C INV(-1) SD(-1) BL LIT MI D(LIT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	64.67334	21.22725	3.046713	0.0064
INV	0.199159	0.251130	0.793054	0.4371
SD(-1)	0.551442	0.251973	2.188496	0.0407
BL	-0.318469	0.157890	-2.017035	0.0573
LIT	-0.000462	0.000151	-3.061567	0.0062
MI	-0.099213	0.344507	-0.287985	0.7763
D(LIT)	0.000116	0.000120	0.963951	0.3466
R-squared	0.970727	Mean dependent var	38.30296	
Adjusted R-squared	0.961845	S.D. dependent var	18.14954	
S.E. of regression	3.540566	Sum squared resid	250.7121	
F-statistic	110.7285	Durbin-Watson stat	1.898849	
Prob(F-statistic)	0.000000			

Appendix 9. Investment in Socioeconomic Infrastructure and Urban Economic Growth- Ogun State

Dependent Variable: LOG(INC)

Method: Least Squares

Date: 08/18/07 Time: 09:19

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.600432	0.989272	0.606943	0.5498
LOG(INVINC)	0.005314	0.053959	0.098479	0.9224
LOG(INC(-1))	0.873879	0.098649	8.858511	0.0000
LOG(BL)	0.113691	0.183310	0.620214	0.5412
R-squared	0.933247	Mean dependent var	8.714630	
Adjusted R-squared	0.924540	S.D. dependent var	0.476400	
S.E. of regression	0.130867	Akaike info criterion	-1.093322	
Sum squared resid	0.393900	Schwarz criterion	-0.901346	
Log likelihood	18.75984	F-statistic	107.1852	
Durbin-Watson stat	1.039251	Prob(F-statistic)	0.000000	

Appendix 10. Industrial Growth and Urban Blight – Ogun State.

Dependent Variable: BL
 Method: Least Squares
 Date: 01/28/06 Time: 09:08
 Sample: 1977 2004
 Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	128.8987	11.52812	11.18124	0.0000
INGR	-1.049797	0.224223	-4.681925	0.0001
R-squared	0.457434	Mean dependent var	76.25893	
Adjusted R-squared	0.436566	S.D. dependent var	17.95639	
S.E. of regression	13.47847	Akaike info criterion	8.108813	
Sum squared resid	4723.396	Schwarz criterion	8.203970	
Log likelihood	-111.5234	F-statistic	21.92043	
Durbin-Watson stat	0.254396	Prob(F-statistic)	0.000078	

Appendix 11. Population Density and Sustainable Development – Ogun State.

Dependent Variable: SD
Method: Least Squares
Date: 02/01/08 Time: 19:56
Sample: 1977 2004
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	89.99894	10.68682	8.421486	0.0000
URB	-0.404906	0.131985	-3.067816	0.0051
URB ²	0.000504	0.000355	1.419300	0.1682
R-squared	0.806224	Mean dependent var	37.62607	
Adjusted R-squared	0.790721	S.D. dependent var	19.13695	
S.E. of regression	8.754575	Akaike info criterion	7.277987	
Sum squared resid	1916.064	Schwarz criterion	7.420723	
Log likelihood	-98.89182	F-statistic	52.00731	
Durbin-Watson stat	0.355347	Prob(F-statistic)	0.000000	

Appendix 12. Investment in Socioeconomic Infrastructure and Urbanisation – Oyo State

Dependent Variable: URB
 Method: Two-Stage Least Squares
 Date: 01/28/06 Time: 09:16
 Sample(adjusted): 1978 2004
 Included observations: 27 after adjusting endpoints
 Instrument list: BL INV(-1) C URB(-1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.53973	6.181924	1.866689	0.0742
INV	-0.068199	0.036117	-1.888263	0.0711
URB(-1)	0.992524	0.023126	42.91893	0.0000
R-squared	0.991350	Mean dependent var	217.8148	
Adjusted R-squared	0.990829	S.D. dependent var	61.40473	
S.E. of regression	5.944321	Sum squared resid	848.0387	
F-statistic	1375.782	Durbin-Watson stat	1.851116	
Prob(F-statistic)	0.000000			

Appendix 13. Quality of Life and Sustainable Development – Oyo State.

Dependent Variable: SD

Method: Two-Stage Least Squares

Date: 01/28/06 Time: 09:19

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Instrument list: INF C INC(-1) SD(-1) BL LIT MI D(LIT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-9.238830	10.69045	-0.864214	0.3977
INV	0.010281	0.091457	0.112415	0.9116
SD(-1)	0.780948	0.263804	2.884520	0.0092
BL	0.189827	0.213049	0.797130	0.4347
LIT	-3.47E-05	2.02E-05	-1.712541	0.1023
MI	1.947439	1.218032	1.598840	0.1255
D(LIT)	2.14E-05	2.50E-05	0.854663	0.4029
R-squared	0.938315	Mean dependent var	38.86444	
Adjusted R-squared	0.919809	S.D. dependent var	16.24333	
S.E. of regression	4.599780	Sum squared resid	423.1595	
F-statistic	50.53885	Durbin-Watson stat	2.228075	
Prob(F-statistic)	0.000000			

Appendix 14. Investment in Socioeconomic Infrastructure and Urban Economic Growth- Oyo State

Dependent Variable: LOG(INC)

Method: Least Squares

Date: 08/18/07 Time: 09:30

Sample(adjusted): 1978 2004

Included observations: 25

Excluded observations: 2 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.853752	1.192130	2.393827	0.0261
LOG(INVINC)	0.069839	0.044645	1.564306	0.1327
LOG(INC(-1))	0.989609	0.053190	18.60526	0.0000
LOG(BL)	-0.543999	0.179813	-3.025350	0.0084
R-squared	0.985139	Mean dependent var	9.589384	
Adjusted R-squared	0.983018	S.D. dependent var	0.874116	
S.E. of regression	0.113918	Akaike info criterion	-1.361029	
Sum squared resid	0.272523	Schwarz criterion	-1.166009	
Log likelihood	21.01287	F-statistic	484.0250	
Durbin-Watson stat	1.057780	Prob(F-statistic)	0.000000	

Appendix 15. Industrial Growth and Urban Blight – Oyo State.

Dependent Variable: BL
Method: Least Squares
Date: 01/28/08 Time: 09:20
Sample: 1977 2004
Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	96.36864	7.254422	13.28412	0.0000
INGR	-0.215812	0.072737	-2.967007	0.0064
R-squared	0.252941	Mean dependent var	75.46571	
Adjusted R-squared	0.224208	S.D. dependent var	10.39331	
S.E. of regression	9.154329	Akaike info criterion	7.335080	
Sum squared resid	2178.845	Schwarz criterion	7.430237	
Log likelihood	-100.6911	F-statistic	8.803132	
Durbin-Watson stat	0.122230	Prob(F-statistic)	0.006375	

Appendix 16. Population Density and Sustainable Development -- Oyo State.

Dependent Variable: SD
 Method: Least Squares
 Date: 12/07/05 Time: 10:11
 Sample: 1977 2004
 Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	194.3949	24.24907	8.016593	0.0000
URB	-1.249424	0.231105	-5.406312	0.0000
URB ²	0.002290	0.000516	4.438988	0.0002
R-squared	0.818889	Mean dependent var	40.13357	
Adjusted R-squared	0.804379	S.D. dependent var	17.29662	
S.E. of regression	7.650131	Akaike info criterion	7.008280	
Sum squared resid	1463.113	Schwarz criterion	7.151016	
Log likelihood	-95.11591	F-statistic	56.51100	
Durbin-Watson stat	0.560577	Prob(F-statistic)	0.000000	

Appendix 17 . Investment in Socioeconomic Infrastructure and Urbanisation – Ondo State

Dependent Variable: URB

Method: Two-Stage Least Squares

Date: 01/28/06 Time: 09:28

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Instrument list: BL INV(-1) C URB(-1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.52037	35.19503	1.009244	0.3229
INV	0.001224	0.006232	0.196336	0.8460
URB(-1)	0.818265	0.197821	4.136390	0.0004
R-squared	0.775255	Mean dependent var		192.8148
Adjusted R-squared	0.756527	S.D. dependent var		12.08316
S.E. of regression	5.962197	Sum squared resid		853.1469
F-statistic	40.39034	Durbin-Watson stat		2.000594
Prob(F-statistic)	0.000000			

Appendix 18. Quality of Life and Sustainable Development – Ondo State.

Dependent Variable: SD

Method: Two-Stage Least Squares

Date: 01/28/06 Time: 09:30

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Instrument list: INF C INV(-1) SD(-1) BL LIT MI D(LIT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.40714	12.40596	-0.838882	0.4115
INV	0.004017	0.004611	0.871292	0.3939
SD(-1)	0.729760	0.081922	8.908013	0.0000
BL	0.809869	0.318676	2.541356	0.0194
LIT	-0.000307	0.000138	-2.223168	0.0379
MI	-1.583887	0.742086	-2.134373	0.0454
D(LIT)	0.000152	0.000166	0.914353	0.3714
R-squared	0.964782	Mean dependent var	40.61000	
Adjusted R-squared	0.954216	S.D. dependent var	17.84364	
S.E. of regression	3.818039	Sum squared resid	291.5484	
F-statistic	90.97761	Durbin-Watson stat	1.486351	
Prob(F-statistic)	0.000000			

Appendix 19. Investment in Socioeconomic Infrastructure and Urban Economic Growth- Ondo State

Method: Least Squares

Date: 08/18/07 Time: 09:37

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.444560	1.567897	2.196931	0.0384
LOG(INVINC)	-0.049459	0.028543	-1.732809	0.0965
LOG(INC(-1))	0.880386	0.077908	11.30036	0.0000
LOG(BL)	-0.584860	0.400078	-1.461865	0.1573
R-squared	0.952160	Mean dependent var	8.974740	
Adjusted R-squared	0.945920	S.D. dependent var	0.539441	
S.E. of regression	0.125448	Akaike info criterion	-1.177900	
Sum squared resid	0.361955	Schwarz criterion	-0.985924	
Log likelihood	19.90165	F-statistic	152.5890	
Durbin-Watson stat	1.357692	Prob(F-statistic)	0.000000	

Appendix 20. Industrial Growth and Urban Blight – Ondo State.

Dependent Variable: BL
 Method: Least Squares
 Date: 01/28/06 Time: 09:32
 Sample: 1977 2004
 Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	87.40261	4.235526	20.63560	0.0000
INGR	-0.128679	0.100151	-1.284849	0.2102
R-squared	0.059703	Mean dependent var	82.12679	
Adjusted R-squared	0.023538	S.D. dependent var	5.562294	
S.E. of regression	5.496442	Akaike info criterion	6.314828	
Sum squared resid	785.4828	Schwarz criterion	6.409986	
Log likelihood	-86.40759	F-statistic	1.650838	
Durbin-Watson stat	0.226581	Prob(F-statistic)	0.210174	

Appendix 21. Population Density and Sustainable Development – Ondo State.

Dependent Variable: SD
 Method: Least Squares
 Date: 12/06/05 Time: 17:39
 Sample: 1977 2004
 Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2302.177	564.1488	4.080787	0.0004
URB	-22.37408	5.823966	-3.841726	0.0007
URB ²	0.054994	0.014983	3.670500	0.0011
R-squared	0.645119	Mean dependent var	41.83821	
Adjusted R-squared	0.616728	S.D. dependent var	18.67730	
S.E. of regression	11.56292	Akaike info criterion	7.834441	
Sum squared resid	3342.527	Schwarz criterion	7.977177	
Log likelihood	-106.6822	F-statistic	22.72305	
Durbin-Watson stat	0.351777	Prob(F-statistic)	0.000002	

Appendix 22 . Investment in Socioeconomic Infrastructure and Urbanisation – South-West Nigeria

Dependent Variable: URB

Method: Two-Stage Least Squares

Date: 07/05/07 Time: 23:07

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Instrument list: INV(-1) C URB

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	74.19747	46.97956	1.579357	0.1273
INV	-0.004759	0.008431	-0.564482	0.5777
URB(-1)	1.026836	0.022210	46.23355	0.0000
R-squared	0.995323	Mean dependent var	2949.815	
Adjusted R-squared	0.994933	S.D. dependent var	1225.790	
S.E. of regression	87.25139	Sum squared resid	182707.3	
F-statistic	2565.849	Durbin-Watson stat	1.080936	
Prob(F-statistic)	0.000000			

Appendix 23. Quality of Life and Sustainable Development –Urban South-West Nigeria.

Dependent Variable: SD

Method: Two-Stage Least Squares

Date: 07/06/07 Time: 00:30

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Instrument list: INC C INV(-1) SD(-1) BL LIT MI D(LIT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-77.67007	86.77370	-0.895088	0.3814
INV	0.000291	0.001538	0.188977	0.8520
SD(-1)	0.660709	0.153607	4.301309	0.0003
BL	0.344929	0.249027	1.385109	0.1813
LIT	-5.60E-05	3.38E-05	-1.658141	0.1129
MI	1.422200	1.154025	1.232383	0.2321
D(LIT)	2.71E-05	3.73E-05	0.726598	0.4759
R-squared	0.917883	Mean dependent var	156.2726	
Adjusted R-squared	0.893248	S.D. dependent var	58.68796	
S.E. of regression	19.17511	Sum squared resid	7353.695	
F-statistic	37.29791	Durbin-Watson stat	2.271633	
Prob(F-statistic)	0.000000			

Appendix 24. Investment in Socioeconomic Infrastructure and Urban Economic Growth- South-West Nigeria

Dependent Variable: LOG(INC)

Method: Least Squares

Date: 08/18/07 Time: 08:56

Sample(adjusted): 1978 2004

Included observations: 27 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.34563	1.277799	10.44423	0.0000
LOG(INV/INC)	-0.328458	0.033165	-9.903833	0.0000
LOG(INC(-1))	0.409927	0.077883	5.263366	0.0000
LOG(BL)	-1.437303	0.144431	-9.951466	0.0000
R-squared	0.959050	Mean dependent var	10.65014	
Adjusted R-squared	0.953708	S.D. dependent var	0.652237	
S.E. of regression	0.140332	Akaike info criterion	-0.953656	
Sum squared resld	0.452942	Schwarz criterion	-0.761680	
Log likelihood	16.87435	F-statistic	179.5516	
Durbin-Watson stat	0.989794	Prob(F-statistic)	0.000000	

Appendix 25. Industrial Growth and Urban Blight – South-West Nigeria.

Dependent Variable: BL
 Method: Least Squares
 Date: 07/08/07 Time: 00:39
 Sample: 1977 2004
 Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	444.0059	32.64537	13.60088	0.0000
INGR	-0.412809	0.077099	-5.351682	0.0000
R-squared	0.524163	Mean dependent var	274.1143	
Adjusted R-squared	0.505861	S.D. dependent var	57.30170	
S.E. of regression	40.28024	Akaike info criterion	10.29835	
Sum squared resid	42184.94	Schwarz criterion	10.39351	
Log likelihood	-142.1769	F-statistic	28.64050	
Durbin-Watson stat	0.178555	Prob(F-statistic)	0.000013	

Appendix 26. Population Density and Sustainable Development – Urban South-West Nigeria.

Dependent Variable: SD

Method: Least Squares

Date: 07/08/07 Time: 00:41

Sample(adjusted): 1977 2002

Included observations: 26 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	329.7522	11.83573	27.86074	0.0000
URB	0.148225	0.028599	5.182854	0.0000
URB ²	-0.189388	0.027799	-6.812026	0.0000
R-squared	0.904482	Mean dependent var		165.6169
Adjusted R-squared	0.896177	S.D. dependent var		62.57803
S.E. of regression	20.16367	Akaike info criterion		8.953809
Sum squared resid	9351.196	Schwarz criterion		9.098974
Log likelihood	-113.3995	F-statistic		108.8967
Durbin-Watson stat	1.230949	Prob(F-statistic)		0.000000