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Original Research Article

Urban Faming for Sustainable City, Lokoja – Nigeria

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Abstract

Sustainable city (eco-city) is design with consideration of environmental impact inhabited by people dedicated to minimization of required input of energy, food, water and air pollution-$C0_2$, methane. This paper focused on urban farming, urban farming practices in Lokoja. Rice is currently grown at the flood plain of Niger River, where it form a confluence with Benue River. Characterized by flat terrains and rich alluvia soils. The crop is cultivated in October/November and harvested in May at the onset of the raining season. Methods of irrigations include channel irrigation, and water pump irrigations system. The aim of the study was to determine impact of urban farming on city sustainability, problems and challenges of urban farming. Three hundred and fifty questionnaire were administered using stratified random sampling technique. Descriptive statistics was used to analyze the data. Correlation coefficients were used in analyzing fallow period and soil characteristics. Findings from the study revealed that urban farming creates employment opportunity for the urban labour, also the proximity of the farms to the urban market-Lokoja International Market reduce cost of transporting farm produce and energy input to the environment. There is no significant difference in the soil characteristics and years of fallow.
The author advocates:

- **Land reform to achieve food security, security of tenure and ease of access to land, equity and stability.**
- **Renewable energy sources such as wind turbines, solar panels, or bio-gas created from sewage.**
- **Improved public transportation and increase in pedestrialization to reduce car emission were recommended toward achieving a sustainable city. Farm input should be made available for farmers at subsidize rate.**

Key Words: Sustainable City, Urban Farming, Renewable Energy

INTRODUCTION

Urbanization involves a process of human agglomeration into multifunctional settlement. Urban centres in developing countries are generally lively places to live in, with many opportunities that cannot be found in the rural areas. The occurrence and existence of the persistent rapid urban growth and the consequence urbanization problems in Nigeria generated and attracted government concerns. Urbanization is the process in which the number of people living in cities increases. About 2.7 billion people in the developing world live in urban areas and 96% of the additional 1.4 billion people in the developing world by 2030 will live in cities (World Bank 2013).

Human are social creatures and thrive in urban

spaces that foster social connections. Because of this, a shift to more dense urban living would provide an outlet for social interaction and conditions under which humans can prosper, contrary to common belief, urban systems can be more environmentally sustainable than rural or suburban living with people and resource located so close to one another. It is possible to save energy and resources. Things such as: food transportation and mass transit systems. Cities benefit the economy by locating human capital in one relatively small geographic area where ideas can be generated.

Urban Planning Policy in Nigeria

First, Town planning and development era was ushered in the 1963 town ordinance which was concern mainly with aspects of building and environmental sanitation and hygiene. In 1946, the town and country planning ordinance fashioned after the 1932 British law was enacted, its main objective was to secure proper sanitary condition, amenities and convenience, it provided for the establishment of planning authorities with sole responsibilities for town planning activities.

The post independence development plans 1962-1985 have in their objectives among others the relevance of physical development and planning policies to the achievement and promotion of better living conditions, economic growth and social development. There were also land use decree of 1978, National Housing Policy of 1991, Environmental Protection Edict of 1990 and urban and regional planning law (decree 88 of 1992). These were all meant to address the persistent urban problems such as land acquisition, provision of adequate housing (low cost), and overall improvement of the quality of urban environment.

The Land Use Act Of 1979

The land use Act has become the defining document for land administration in Nigeria. The land use Act was introduced as decree No. 6 of 1978. In the address given by commander Kanu on the occasion of the delivery of the Lagos State Land use Law on May 25th 1978, reported in papers and cited in Omotola (1980), Gyuse and Olateru-Olagbegi (1982). He gave four populist reasons for the promulgation of the decree. He said the objectives of the decree were:

1. To remove bitter controversies resulting from land issues such as boundary disputes.
2. To simplify and streamline land management and ownership
3. To assist citizens irrespective of their social status to obtain their ambition of owning land with secure tenure.
4. To enable the government to control land in all parts of the country.

In 1980, Professor Essang the then Federal Minister of Works gave further insight when he asserted at a workshop that the Act was intended to.

1. Curb land speculation and reduce land price
2. Make it easier for government to acquire land in the public interest.
3. Unify land legislation
4. Unify holdings and remove fragmentation and thereby speed up modernization in the rural agricultural sector.

In the 1982 review of the implementation of the Act by Gyuse and Olateru-Olagbegi (1982) found that, noble as the objectives were; they became a mirage. Controversies over land and land administration persisted with increasing tempo and accompanying violence; land speculation was not reduced only the modes of speculative behaviours changed. Agricultural development was not accelerated, rather as the Obas and Chiefs feared. It was a few of the wealthy people who under protection of the Act dispossessed thousands of peasant farmers in the name of large scale farming. Many of these farms never took off and their owners have become speculators rather than farmers. Tenure is not any more secure under the Act than it was before, in some cases where people had freehold titles, it has become worse.

There are many who believe that the act should be amended, but the Land Use Act is entrenched in the national constitution of Nigeria. Therefore to amend it is not a simple matter of reviewing the law; it would require an amendment to the constitution.

Sustainable City Programme (SCP)

The programme was conceived and promoted by the United Nation centre for Human Settlement (UNCHS) and the United Nations Environment Programme (UNEP) since 1990 for building capacities in Urban Environmental Planning, and Management. The programme is primarily concerned with sustainable development of the Urban Environment. The sustainable city programme is conceptualized as a bottom-up broad-based participatory strategy for the planning and management of the urban environment. As much as possible, the sustainable city programme responds to local urban development issues as perceive by the stakeholders ranging from the public and private sector groups to communities and households. It was formulated as a strategy for the implementation of concepts and approaches articulated in a UNCHS and UNEP document titled. Environmental guidelines for settlement planning and management (UNCHS and UNEP 1987). The central argument of the sustainable city programme is that for Urban Environmental Infrastructure to be developed or improved, as the case may be and sustainably maintained, there is need to involved stakeholders in the urban environmental infrastructure, in project identifi-

cation, planning, implementation, operation and maintenance.

The sustainable city programme as a new paradigm aims at influencing urban environmental planning and management at the various levels: city, national and regional level. At this level, the sustainable city programme is a technical co-operation programme that aim at strengthening the capacity of urban councils and other stakeholder and partners in city development such as public and private sector agencies, communities, NGOs, householders and individuals in environmental planning and management. Ogu (2000).

Consequently, the programme is founded on broad-base, cross-sectoral and stakeholders' participatory approach that promote urban environmental governance processes and the basis for achieving sustainable urban growth and development.

Modus Operandi of SCP

The sustainable city programme is able to provide support not only at the technical and operational level but also at the administrative, managerial and political levels. Under the programme, planning is not simply exercise but a process that involves negotiating rules among various actors and arriving at a consensus. The sustainable city programme approach is flexible, programmatic and responsive and is based on the concept that participatory management is the most effective response to environmental problems. Another task to the sustainable city programme is to ensure that government funds are strategically used for sustainable development.

The key to the sustainable city programme approach is that it does not prescribe solution, rather it, puts in place a process which ensures that development issues are debated by all concerned and that a consensus is reached on how to deal with them.

This may take time and patience but it will result in everyone accepting responsibility for their part in ensuring lasting development, which is the essence of a sustainable city.

Urban Farming

Urban farming is the process of growing and distributing food and raising animals in and around a city or in urban area. Urban farming is different from rural agriculture because it is integrated into the urban economic and ecological system; urban agriculture is embedded in an interacting with the urban ecosystem such linkage include the use of urban residents as labourers, use of typical urban resources (like organic waste as compost and urban waste water for irrigation) direct links with urban consumers. Direct impacts on urban ecology (positive and negative) being part of the urban food system competing for land with other functions being influenced in urban policies and plans etc. There are many motivations behind urban agriculture, but in the context of creating a sustainable city, this method of food cultivation save energy in food transportation and saves costs. In order for urban farming to be successful method of sustainable food growth, cities must allot a common area for community gardens or farms as well as a common area for a farmers market in which the foodstuffs grown within city can be sold to the resident of the urban system.

Urban farming offers to make our food as 'local' as possible. By growing what we need near where we live, we decrease the 'food miles' associated with long distance transportation, we also get the freshest produce money can buy and we are encouraged to eat in season. Another benefit of urban farming is that it can add greenery to cities reducing harmful runoff, increasing shading and countering the unpleasant heat island effect. Garden plots can help people reconnect with the earth, and gain a greater appreciation for where our food comes from.

However, plots of land in cities are often expensive, especially since gardens tend to contribute to gentrification and rising rents. Urban soils can be loaded with lead, arsenic and other toxins requiring remediation or replacement before planting can be done safely.

Study Area

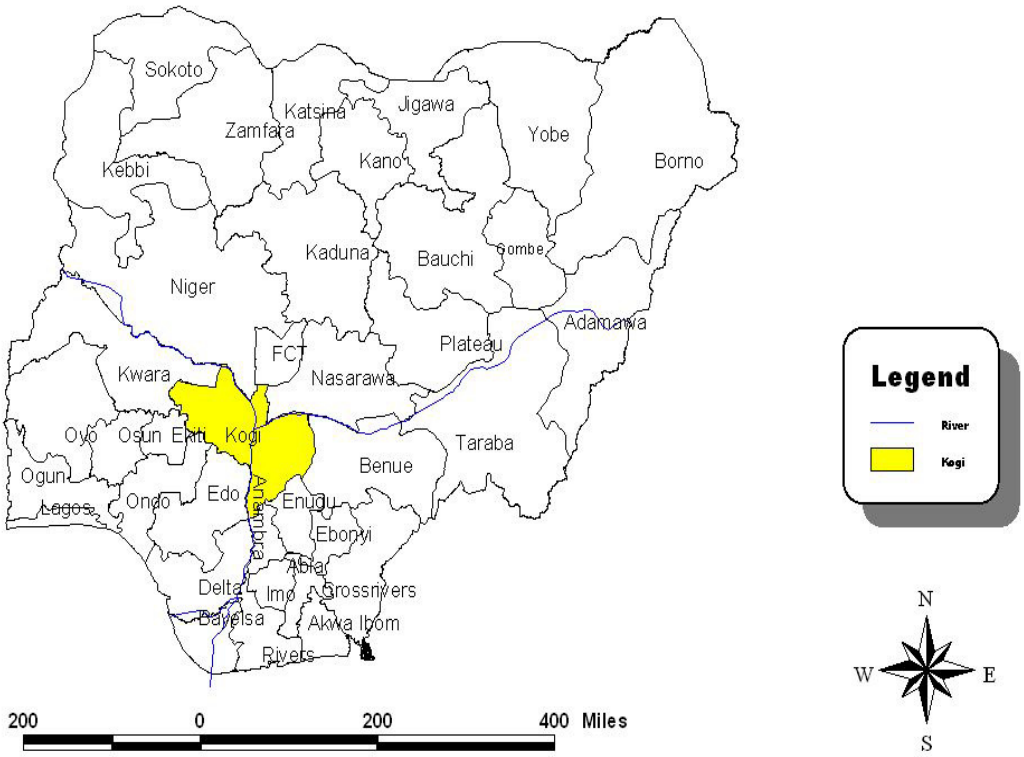
Lokoja the First British settlement in the Northern Part of Nigeria is situated at the meeting point of the River Niger and Benue where they form a confluence and make a Southward turn in their journey to the Atlantic Ocean about 547 kilometers. (Figure 1)

It was selected for the first British Consulate in the interior (1860-1869) and for the military headquarters for Sir Gorge Goldier's Royal Niger Company (1886-1900).

Lokoja is located on the intersection point of co-ordinate $7^0 55^l N$ $6^0 45^l E$ $7\ ^0 44^1 N$ $6^0 44\ ^l E$ on a map of Nigeria. It is a town situated on the slope of a range of hills called Mount Patti. The town in its growth runs down the slope and expands into the Niger River valley. Being a town that develops in the 1860s as a result of European commercial activities and later political activities, Lokoja is presently the administrative capital of Kogi State created in 1991. It lies on the right hand side of kilometer seventy-six of the Okene-Abuja Road. (Figure 2)

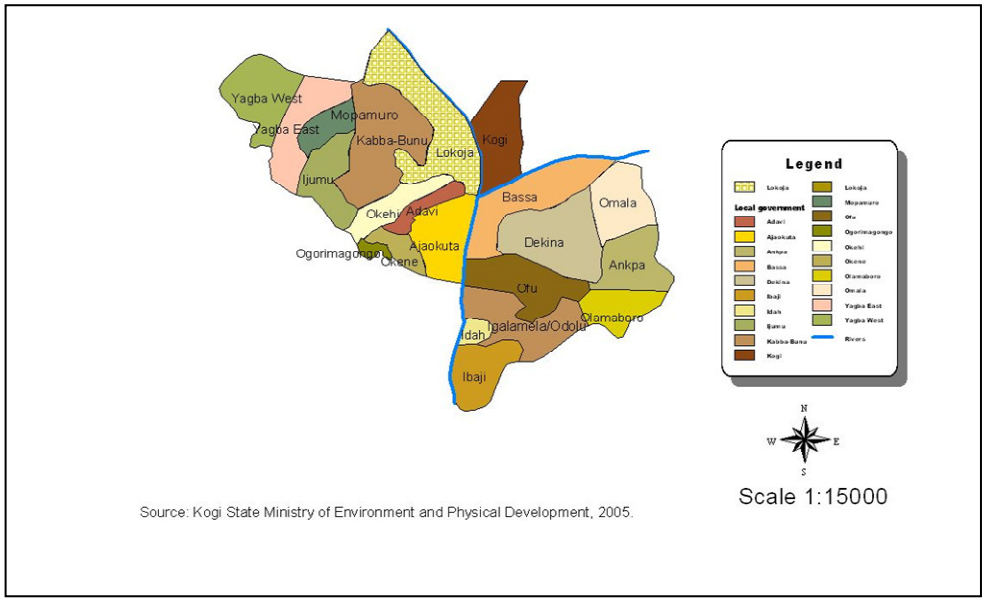
Population

The location of Lokoja may be very deceptive vis a vis it growth and development and this may lead the causal observer to draw wrong conclusion about the impact of



Source: Kogi State Ministry of environment and Physical Development,2000.

Figure 1. Map of Nigeria showing Kogi State



Source: Kogi State Ministry of Environment and Physical Development, 2005.

Figure 2. Map of Kogi State

the advantageous location. This is because through history, Rivers has promoted population density by references to literature, music and religion. River valley as in the classic case of the Nile, Euphrates and Tigris commonly hold Dense Population for they have a fertile soil, a smooth terrain and inherent capacity for transportation.

According to 2004 National Population Census, the population figure of Lokoja was 195,261 people. It occupies a land area of about three thousand one

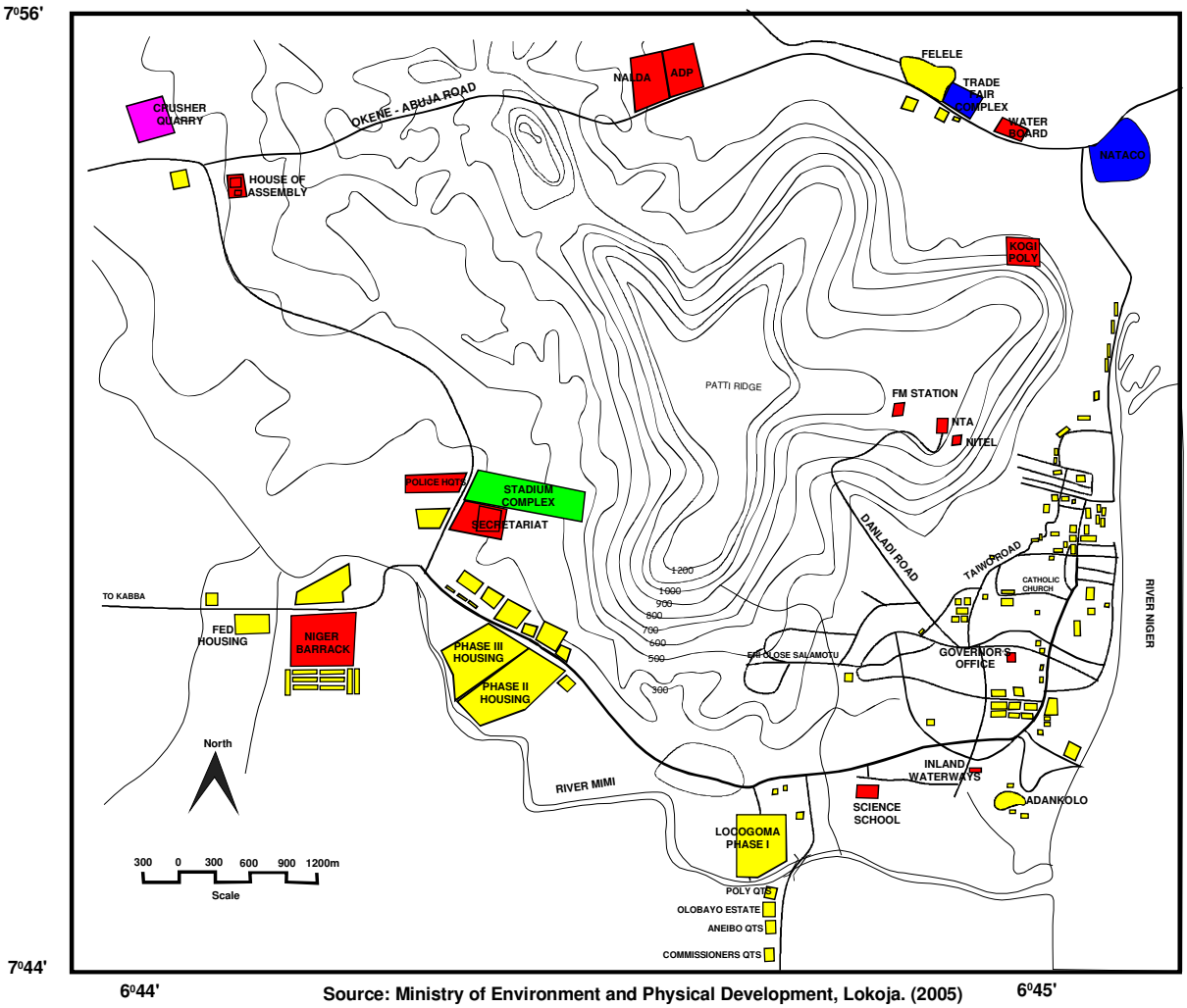


Figure 3. Map of Lokoja

hundred and eighty square kilometers (3,180km^2). (Figure 3)

Aims and Objectives

The following are the objectives that guided this research
i. To determine the relationship between household incomes, rent and expense on services.
ii. To examine the impact of urban farming on city sustainability.
iii. To identify problems of urban farming
iv. To make recommendation towards achieving the goal of sustainable city.

RESEARCH METHODOLOGY

The researcher made use of primary data for the study. In depth interviews and focus group discussions were adopted. 350 self administered questionnaire to various clustered farmers using stratified random sampling. Soil samples were also collected and analyzed in laboratory.

Data Analysis

Inferential statistics such as analysis of variance and regression method were used in testing the hypothesis and correlation coefficients in soil fallow and soil nutrient.

Hypothesis

Ho: There is no significant difference in soil characteristics and age of fallow.
Hi: There is significant difference in soil characteristics and age of fallow.

ANALYSIS AND DISCUSSION

Regression

Table 1. Model Summary

Model	R	R Square	Adjusted square	Std error of the estimate
1	0.240	0.058	0.048	1.26

Hypothesis Testing

Ho: There is no significant relationship between household income, rent and expenses on services
Hi: There is significant relationship in household income, rent and expenses on services.

Table 2. Analysis of variance (ANOVA)

Model	Sum of squares	Df	Mean square	F	Sig
Regression	19.494	2	9.747	6.117	0.003
Residual	318.693	325	1.593		
Total	338.167	327			

Source: Author's field work 2014

Since the calculated f value 6.117 is greater than tabulated f value which is 3.00 at a degree of freedom of 2 and 325 at 0.05 significance level, we accept H_1 which state that there is significant relationship between household income, rent and expenses of services in the study area.

Table 3. Correlation coefficient of household income rent and expenses on services

	Income	Rent	Service expenses
Income Pearson Correlation Sig. (2-tailed	1.000	-193	-161
Rent Pearson Correlation Sig. (2-tailed)	-193 0.006 203	1.000 - 203	0.092 0.190 203
Service Pearson Expenses Correlation Sig. (2- tailed)	-161 0.022 203	092 -190 203	1.00 203

Source: Authors field work 2014.

High income households spend lower proportion of their incomes on house rent and service expenses. This may be noted in table 3 as income correlates negatively with rent (-.193), service expenses (-161). This implies that the higher the household income, the lower the proportion spent on rent and on services.

Table 4. Coefficients

Model	Unstandadize coefficient		Standardize coefficient		
	B	Std. Error	Beta	t	sig
(constant)	1.684	0.140	- 1.79	12.052	0.000
Rent	- 0.182	0.070	- 1.7.9	- 2.200	0.010
Expenses On services	- 0.147	0.070	- 144	- 2-090	0.038

The considerable degree of relationship noted between household income, rent and services expenses usually depend on the type of housing chosen and inference on the price of the house subject to income. However the proportion of household income spent on rent and services varies inversely with income.

Soil related problem in urban farming

Given the variety and potentials of Nigerian soils and the obvious successes of the peasant farmers and the crucial role in the nation's economy, the recent abysmal food crops production in the area studied is due mainly to poor soil and land management. Three major types of soil-related environmental problems have arisen as a result of abuse through grazing, bush burning, fuel wood exploitation. The current heightened negative impact of these activities on the vegetation and the soils in particular must be understood in light of the increasing variability of annual rainfall and the persistence of drought conditions especially, in the northern savanna lands. Three major types of soil-related environmental problems have arisen as a result, they are: soil deterioration, soil desiccation and accelerated soil erosion.

Soil deterioration

Soil deterioration is general lowering of the natural fertility and consequently, the productivity of a soil. It involves a marked fall in the humus and nutrient content of the soil and a degradation of its physical structure. In Nigeria, soil deterioration is brought about mainly by repeated cropping, bush burning and exposure of the soil to intense isolation and heavy rains as a result of various human activities.

These conditions are all features of shifting cultivation with bush fallowing- the most widespread traditional soil management system in Nigeria. The fall in the efficacy of bush fallows in restoring soil fertility is particularly true of savanna fallows which are not only grazed by cattle but

Table 5. Correlation between soil characteristics and age of fallow: Savanna fallow soils, North Central Nigeria

	Bulk	Porosity	Moisture	Ph	Organic	N	CEC	P	K	Ca^{++}
r	0.33	0.33	0.52	0.20	0.59	0.49	0.52	0.24	0.58	0.44
s	0.15	0.15	0.04	0.27	0.02	0.06	0.04	0.22	0.02	0.08

r = correlation coefficient
s= level of significant
Source: Author Field Work, 2014

are also burnt off every dry season. Thus, while the savanna fallow lands area ostensibly at rest-in the sense that they are not being cultivated-the ecosystem is in fact kept in a state of protracted immaturity by the annual bush fires, the soil is of course of worse for it.

Table 5 was derived from a study carried out in Lokoja L.G.A of Kogi State, indicate low correlation between soil characteristics and age of fallow. The rate and magnitude of improvement of soil conditions are not commensurate with the age of length of fallow. The study above highlights the low status of fallow soil in available soil phosphorous (0.24) and magnesium 0.47.

Soil desiccation

Reduction in the fallow periods and the corresponding increases in the length of the period of cultivation together with annual bush burning have all meant a greater exposure of the land surface to the vagaries of the weather, one outcome of improper land exposure is soil desiccation which is a progressive drying out and hardening of the soil. It is a process manifested by the lateritic crusts and hard clay pans in many Nigeria soils especially those characterized by clay-enriched subsoil horizons and abundant free iron oxide. The predominantly sandy soils, on the other hand, lose whatever cohesion they might have had and are easily washed or blown away, soil desiccation is most serious in the savanna and secondary forest areas where there is widespread occurrence of clay pans and iron concretions in the soil profiles and where, also there are many outcrops of lateritic crusts on hill summits and valley shoulders and along footpaths Areola (1980).

SUMMARY OF FINDINGS

The research paper focused on city sustainability through urban farming practice in Lokoja. The results from findings have led the author of this paper to the following:

- That urban farming provides employment opportunity to urban labour force.

Figure 4. Rice farming

- The urban farming practice provide food for all round season, water from Niger River serves for irrigation scheme in the area study.
- There is no significant difference in soil characteristics and age of fallow.
- The proximity of the Lokoja international market save energy in transporting food to the market and it also save cost. The farmers market the foodstuffs grown within city to the resident of the urban system in the market.

The farmer has no title to the land which could be used as collateral and thus tenure is not secure. Finally there is a significant relationship between household income, rent and expenses on services.

CONCLUSION

A sustainable city should be able to feed itself with minimal reliance on the surrounding country side and power itself with renewable source of energy. The crux of this is to create the smallest possible ecological footprint and to produce the lowest quantity of pollution possible, to efficiently use land, compost used materials, recycle it or convert waste to energy and thus the overall contribution to climate change will be minima, if such practice are adhere to.

RECOMMENDATIONS

For policy makers and urban planners, the following recommendations were put forward in achieving city sustainability.

Land reform is an attempt to change or restructure the land holding and ownership pattern in order to achieve certain goals such as food security, security of tenure and ease of access to land equity and social stability. The land use act of 1978 which is the policy document on land administration in Nigeria requires a radical shift to the conferment of land title to farmers which could be tenable as collateral security. Land acquisition and compensation has to be clearly addressed in the Nigerian constitution.

Renewable energy source: such as wind turbines, solar panels or biogas created from sewage, cities provide economic of scale that make such energy source viable.

Improved public transport and increase in pedestraili-

zation to reduce car emissions, this requires a radically different approach to city planning and land use planning with integrated business, indusial and residential zones, roads may be designed to make driving difficult.

REFERENCES

Areola O (1980). *Some Issues and Problems in Studying Savanna Fallow* African Environment No 3 Volume iv pp 63-69.

Environmental Guidelines for settlements planning and management 3 volume Nairobi UNCHS.

Essang SM (1980). *Reflections on some key provisions of the land use* Act (1978): A keynote address by the federal ministers of work, professor S.M Essang, at the national workshop on the land use act (1978) cited in Gyuse and Olateru-Olagbegi (1982). land use act (1978) and policy on land management in Nigeria, NIPSS, Kuru PRS # 2 (1980).

Gyuse TT, Olateru-Olagbegi J (1982). *Land use* act (1978) *and policy on land management in Nigeria*, Kuru, NIPSS, Policy review series, number 2.

Ogu VI (2000). *Stakeholders' partnership Approach to infrastructure provision and management in Developing world cities*. Lessons from the sustainable Ibadan Project. Habitat International. Vol 34. pp 517 – 533.

Omotola JA (1980). *Essay on Land Use* Act (1978) Lagos, Lagos University Press.

United Nations Centre for Human Settlement (UNCHS) and United Nation Environment Programme (UNEP) (1987).

World Commission on Environment and Development (1987). *Our Common Future*, (Bruntland Report) Oxford University Press.