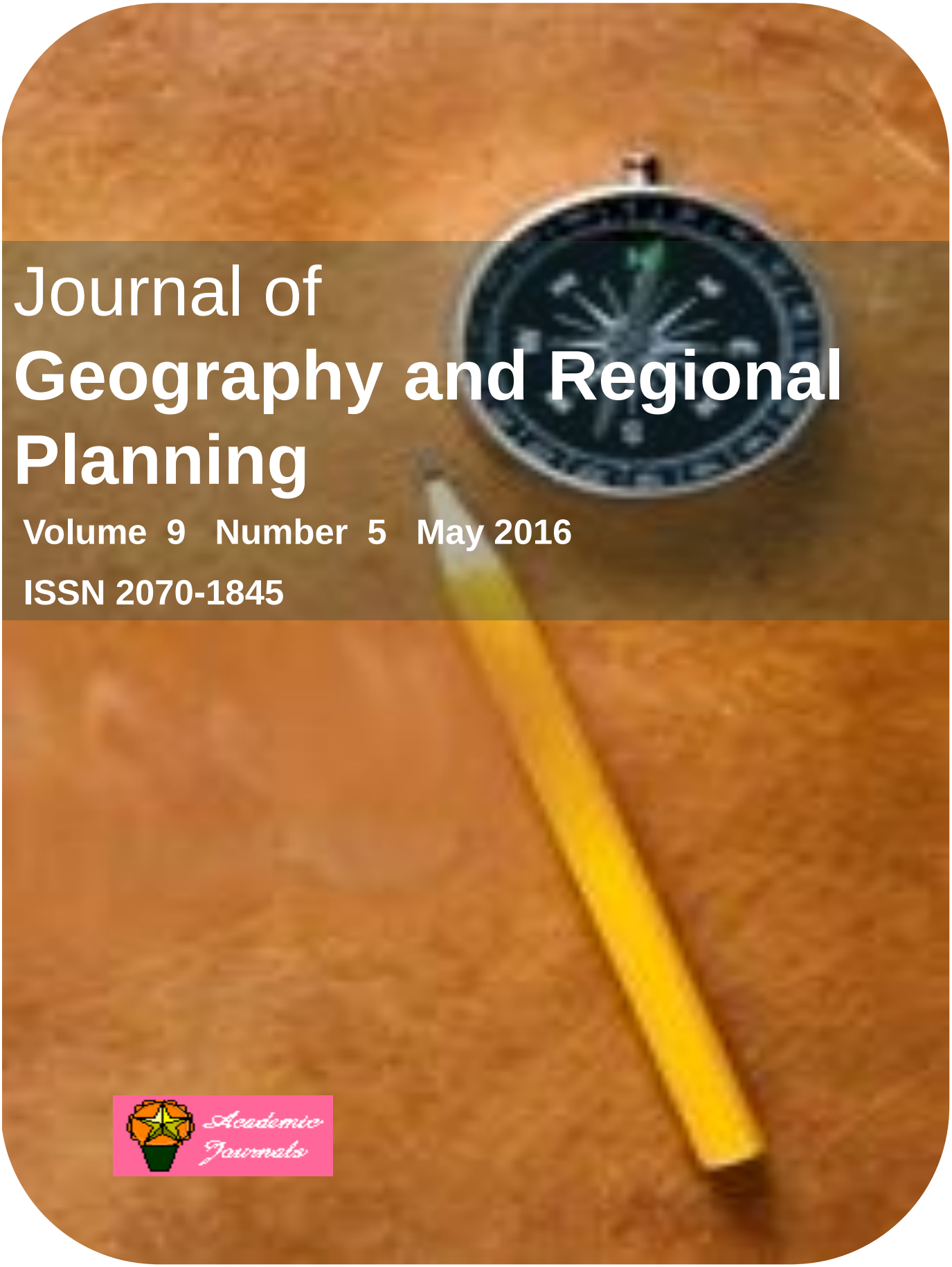

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Full Length Research Paper

Explaining the role of cultural, social and economic factors on quality of residence in urban neighborhoods: A case study of Kerman

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The residential environments provide the main tools for developing different types of life indicators such as health, family, job, and leisure. These environments can create or provide the appropriate conditions for increasing the satisfaction of their dwellers by accessing the required criteria. In various cities of Iran, the lack of consideration to the qualitative criteria of dwelling in the trend of progressions resulted from the industrial developments caused by the construction of unidentified residence environments. In this paper, by explaining the effective factors on the quality of residential in the neighborhood units, by emphasizing social, cultural, and functional – performance factors, each of the elements was divided into the sub-elements study and these indicators are evaluated in different parts of Kerman city. After completing the library – based studies and an open interview with the experts and managers, the qualitative criteria of assessment from the theoretical principles were measured, such as: the homogenizes cultural, social, economics, and the quarter services. The research method is analytic-descriptive and the aim is to improve the quality of residence. A questionnaire with 40 questions was completed, validity of the questionnaires was confirmed by social sciences professors and its stability was confirmed by Cronbach. The questionnaires were generated among 387 of statistical population according to the Cochrane formula. The results were analyzed by Pearson's correlation and a multiple linear regression (MLR) model and they show a significant correlation between the variables affecting the quality of habitation.

Key words: Social capital, economic capital, cultural capital, quality of residence, quality of life, neighborhood units, urban planning.

INTRODUCTION

Today, the spread of industrialization process that is come with the mass production of various goods and services in the quantitative aspect has brought many difficulties for modern human. This diversity and complexity of industrial development have been the reason of much turmoil that despite the fact of development of life quantity, its quality

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is affected. The qualitative aspects of urban contexts and residential neighborhoods are the most important sectors that are affected by the turmoil of the world of industry and mass production. In Iran country, the transformation of urban contexts in recent decades due to urbanism policy programs and strategies for their implementation (which are influenced by economic and financial conditions) have caused residential neighbor-hoods disruptive. This fragmentation is not limited only to the physical structure; it has penetrated the social, economic and cultural sectors. So the residential neighborhoods which in the past had a fundamental role as the urban life cells of residents, with starting the twentieth century and emergence of new cities during industrial period provided unhealthy life conditions. The subject of quality and its assessment have been interesting topics for urban planners in recent years. Environmental assessment will increase the awareness of suitable cities for living (Delotto, 2010, 148). In order to evaluate the environmental quality, there are different factors and standards such as physical, social, cultural and economic criteria and residential environments in urban districts are no exception; despite the importance of this issue, the role of neighborhood and its internal relations in various fields (social, economic, cultural, etc) and impact on life quality have not been considered yet (Manley and van Ham, 2012). It should also be noted that in assessing the degree of satisfaction of residential environments, personal and family characteristics, individual differences in taste and needs have a significant impact on (Whit and Michael, 1978). In this research, we have tried to make a comprehensive review of factors affecting life quality in the various sectors and their importance is considered. Hence in the research hypotheses the existence of district services and social, economic and cultural harmony (same classes' level) and also social interactions are expressed as effective factors in quality of life.

Research hypotheses

Main hypotheses

1. The social, cultural and economic homogeneity (same classes' level) in the urban contexts will improve life quality.
2. The existence of neighborhood services improves life quality in urban contexts.

Secondary hypotheses

1. The existence of neighborhood services increases social interactions.
2. There is a relationship between social interactions of citizens and quality of life in urban contexts.

Neighborhood and Habitant

Each city is formed by neighborhoods which have resemblances and differences from cultural, social, economic and also functional points of view. There is a perfectly simple explanation of neighborhood which believes the city will be formed by adjacent houses in a specific geographical area. District is created by accumulation of more or less continuity, close communication, strong relationship of neighborhood and informal incorporation of group of people. Auguste Comte has a more comprehensive definition of neighborhood. He defines it as a population living in a specific part of city and having organized a formal and informal network of social interaction and are illustrating their common identity with organization of general region. Perception of neighborhoods has to be influenced by time passing or may be needs opinions transformation between generations (Manley and van Ham, 2012). District is a relatively known area at the heart of the city with life sensation which meets the resident's demands (Ghasemi esfahani, 2011, 93). Residence means belonging to a real place. The act of living in or belonging to a specified place is residence and this sense of belonging is also formed in districts and these districts and desired neighborhood units are confluence of social, commercial, skeletal and environmental interactions. There are different aspects involve in creating each residential district with different factors, and finally their relationship will affect the quality of residence. In this paper, the effective factors in quality of residence from social, cultural, commercial and functional points of view will be evaluated.

The district services of elements (operational-functional)

Each neighborhood or district that is chosen according to people's needs and demands requires some services and functional elements to be useful in order to satisfy its residents' needs and these elements are effective factors of creating district structure (Habibi and Masaeli, 2000, 115).The skeleton of each district is formed by two elements:

1-distinct elements (e.g. primary school-mosque)
2-distributive elements (e.g. commercial center, park, sport and medical center)

The Supreme Council of Architecture and Urbanism of Iran enactment (2012), district defined services (Table 1).

The quality of residence is influenced by district elements and also spaces quality and treatment of residents affect positively mental satisfaction. In fact there is a straight and positive relationship between district elements, their access and quality of life in districts and as much as these elements are well organized in districts and are easily accessible can promote the quality

Table 1. District services according to urban planning system of Iran.

Function	Definition
Educational	Preschool educations (kindergarten-nursery school),primary school
Commercial	Daily shopping unit (super market, grocery, bakery, butchery) offices (post, telephone services center, news stand, beauty salon, surgeries
Sport	Small play parks
Clinic	Medical centers
Park	District park
Religious	Mosques, churches, chapels
Urban facilities	Fossil-fuel power station, water and wastewater plant, public toilets
Transportation and storage	Pedestrian, district parking spaces and metro station

Source: Supreme council of architecture and urbanism of Iran enactments (2012)

of life of citizens.

Social factors

Social relationships and humanity connection are known as important and serious factors in life and residence of people, although industrial and modern life consequences have faded the human relationships in current years. So researches and investigations have increased on this issue and they expressed social interactions as principal and also believe these relationships are inseparable from district properties and human society. Francis Fukutama (born October 27, 1952) knows the words of trust, patient, equality, lawfulness, group membership and social activities as social principles.

Bullen (2000) believes each district communities with high social principals have these properties:

1. People feel being part of the district.
2. They feel being useful and helpful and also their abilities will be promoted for real participation in district.
3. Districts belong to them and they have safe feeling inside.
4. Many networks of mutual relationships are formed (Khakpoor, 2009).

Urban planners have to attempt more to create a compatible space to promote and encourage the cultural and familial groups and hence increase the social capitals (Edward, 2011, 207). The way of growth and development of districts and population heterogeneous and their positive and negative effects will be impressive in local and commercial imbalance and others district issues like creation, protection and development of social capitals. In modern societies, urban life will decrease social relations and the communication network of people seems time-worn in comparison to prior periods and this has caused the development of social isolation in district level. This is obvious that economic-skeletal approach of urban planning without attention to cultural-social issues to restore this decay is ineffective. Today, in order to eliminate the fault, some urban planning and management councils, political and neighborhood expansion movements are formed around district which is the smallest unit. People's dignity in a society is defined as another element which has affected the residence quality and social relationships. According to the 'Base Exclusivity' theory, any features that distinguish them in groups based on the task, it can act as an agent in the separation of the base and the dignity of people. The base features due to cultural patterns and the type of work being performed are determined. So, the individual's dignity in a society can be effective for their interactions and also for the amount of these acts and how they interact with other certain groups. In other words, it can be said that the homogeneity of society in terms of social classes makes these interactions easier, which they themselves are due to cultural and economic factors. In this regard, Plato believes the ethnic and cultural homogeneity of citizens will cause more unity for them, and on the other hand heterogeneity will increase local conflicts within the urban population (Fakoohi, 2006, 147). Some researchers believe that within the low income families, there is a lower tendency to respect privacy and there is no attempt in order to confront with social heterogeneity (Liao et al., 2014).

Cultural factors

Ahmed TalebIbrahimi à Al Jazeera (Arab world scientist) defines culture as: *'to know, human are going to where is important as much as to know, human are coming from where and culture ties this bygone issues and also will provide the ability to leap into the future'*. The important issue in the nature of culture is the cultural motifs that through community and training are transferable, therefore culture is contained of spiritual and material motifs of social life that a person was born and bred there and within this way he/she will be given a cultural identity. The relationship between human and cultural aspect is a

phenomenon in which human and environment are partner to form it (Hall, 2011, 4). Culture is a focal of social relations and lifestyle of social units. Aspects of cultural objective and subjective can be the facilitator of feeling, thought and action of cultural funds. Culture is always defined as most important factors of urban life and cultural changes are obvious in societies (Habib and Khastoo, 2014). Culture is known by Bourdieu (1930-2002) as a capital which provides an exclusive access to rare rewards and has the ability to be transmitted between generations. In Bourdieu's point of view this capital is not equally spread within the social spaces as well as the commercial capital but this unequal spread of cultural capital is not the reflection of commercial inequality but on the contrary it reflects the distinction strategy and class-struggle in a specific culture. Bourdieu believes that cultural capital includes special skills, tastes, how to talk, academic degrees and the ways in which a person can distinguish him/herself from others through it. Cultural capital is a collection of terms, information and privileges which a person uses to protect or achieve a social situation. In other words, cultural capital is permanently owned by a class, group, tribe or clan. By adding up above factors it can be said cultural capital has a close relationship with social capital and person dignity and at the same time it is affected sensibly by commercial capital. (Authors)

Economic factors

Karl Marx (1818-1883) believes that the objective and secular condition of life brings prosperity. International researches illustrate that there is a positive correlation between wealth and satisfaction. Bourdieu's view has certain resemblances with the Marxism concept of capital and contains production capital usable in objects production and services. He believes the private situation of person is specified according to volume and kind of his/her capital and will specify their class firstly in family and then in society (Momtaz, 2004). Richard Wilkinson and Kate Pickett in the book of The Spirit Level (2009) have studied the income inequality impacts on the health of the community and made it clear that societies with more equal income, with lower income levels, are happier and healthier than the societies with higher levels of income but unequal income. In their opinion equality and homogeneity have more effect on life quality. They obviously insist on the effective role of social equity in order to protect the freedom and prosperity in different societies and believe that the absence of this equity weakens people's lifestyle and trust plummeting with violence increasing. Ockenfels (German economist) believes the most people are concerned about their financial situation in comparison to others (relative income). Individual's position is determined according to income level and consumption and in the opinion of most people; the importance of confirmation stamp which is achieved by higher level of income is more than other benefits of this ability. Societies with homogenous economic can provide more peace for their occupants and this issue is a requirement of better quality of life.

Social, cultural and economic homogeneity

Homogeneity in Moeen Encyclopedia (second biggest Persian language encyclopedia) means uniqueness, similarity and uniformity. Class is a collection of people who have the same position in terms of social and especially economic aspect; however there are different meaning of class due to the presenter's attitudes and trends. In Weber opinion, class is the wisdom power manifest in the economic field. So if individuals with these indexes have a similar position, from class division they will be known at the same level or called homogeneous. This research is seeking to prove the hypothesis that class homogeneity enhances the life and quality of residence. in this regard, *Social Exhaustion* theory argues that different people with different social - economic levels in urban areas face different stressful factors and as well as the theory is expressing that social – economic dissimilarities in cities and urban areas have different opportunities to resources access and available services of town; on the other hand, the *Spatial Separation* theory leads separated social, economic groups will minimize social decay. Accordingly, it can be concluded that the social, cultural and economic homogeneity and similarity (classes with same level) of the residential areas can increase subjective and objective comfort and can be effective to improve the quality of residential environment (authors). In other words, social, cultural and economic heterogeneity will cause great gap between the various social groups in residential areas and this grouping and class dependency is introduced based on indexes like income, education, occupation, place of residence and housing; and as much as this gap is less, the quality of life is higher. Taken together with theoretical foundations of research and due to the role of impressive factors which affect the quality of life can be understood the significant role of economic, social, cultural factors (Dwira and Abdul, 2013). Hence with emphasis on the role of this homogeneity in order to improve the quality of life, the functional-operational elements are in Table 2.

Research background

To check residential quality, studies of environmental quality as well as life quality can be noted. These studies have mainly evaluated the quality of both objective and subjective aspects and in all the cases human attitude and their mental perceptions are playing major role. Table 3 summarizes the results of measurements of residential quality in domestic and foreign environments.

Table 2. Effective factors and indexes in quality of life according to research hypotheses.

Aspect	Criterion	Detailed-criterion	Index
Functional-skeletal	Access-Transportation	Driving	Situation of neighborhood connection network
			Access to neighborhood public services
			Quality of connection network
		Pedestrian	Quality of pedestrian access to neighborhood services
			Adequate walking time to neighborhood services
	Co-operation	Collaboration	Adequate co-operation of public services and pavement width
			Adequate cooperation with other services
			Incompatible cooperation of larger context services with residential area
	Neighborhood services	Neighborhood services	Mosque-primary school
			Daily commercial building
			Parking
			Green area
			Sportive
			Facilities and equipment's(garbage collecting)
Social	Trust	Confidence	Local council
			Neighbors
	Social interactions	Neighbors relationship	Mourning ceremony participation
			Celebration participation
			Keep in touch with neighbor
			Sense of responsibility to the neighbors
		Others	Freshness and vitality of the community
			Hospitality
	Association	Association	Common goals
			Attend meetings of the local council
Economic		Income rate	How much the inessential stuffs can be afforded
			Afford the life expenditure
		Properties	Dwelling
			Vehicle
Cultural		Education	Academic degree
			Attend studying(relative-parents)
		Interest in cultural issues	Cultural information's
			Cultural meeting Participation

Source: Authors.

The introduction of urban contexts of Kerman City

According to the specific conditions of cultural and climatic issues of the Kerman, it was hosted the different groups that have lived in different parts of the city many years ago. This matter can be seen through many Moslems, Zoroastrian and Jewish's who are living in different neighborhoods of the city. Kerman with a great historical background contains many variable contexts. This research is divided into 5 sections; this division is based on field studies and individual investigations such as urban development plan, comprehensive plan and

Table 3. Research conducted on quality of life assessment.

Conclusion	Examined indexes	Subject	Researcher
Public green space with 0.785, type of people who are treated daily with 0.755 and quality of green space with 0.734 have the highest correlation with the satisfaction of residential environment.	Social environment, access to services, green space and social relations	Effective factors in the satisfaction of residential environment	Fleury-Bahi et al. (2008)
Building density with 0.654 in density field, adolescents deviation with 0.753 in social security field and the lack of neighborhood interests with 0.551 in the field of social facilities have the highest correlation with the environment dissatisfaction.	Social-spatial density, social security, social facilities	Assessment of effective factors on negative impact of the environment	Bonnes et al. (1991)
Age is major predictor of satisfaction of residential units and neighborhoods and it is achieved that elder people are more satisfied than youngers. The impacts of socio-economic situation and sex are too low	Age, sex, socio - economic	The impact of individual characteristics in evaluation of residential units satisfaction	Pull and Cavalini (1989)
Be ownership of housing is the strongest predictor of satisfaction and age has low power to be a predictor as well as income.	Ownership of housing units, income, age, geographical location of housing units	The impact of demographic variables of residential units in European countries	Davis et al. (1982)
In the field of the urban quality, the greatest impact is belonged to the physical and spatial characteristics and the least effect is from content characteristics. In the field of the residential environment quality, the greatest impact is belonged to the exterior facilities of residential unit and the least effect is from interior variables of residential unit.	Urban environment, residential environment, the urban environment quality	The quality measuring of urban environment in new cities (case study: Hashtgerd City)	Moludi J (2010)
Satisfaction with the quality of the residential environment based on the location of the .inner, outer and central parts is different	Access to different activities-functions, access to medical center, access to educational center, easy access to … major urban centers and	Analysis of residential satisfaction in Yazd City	Arasteh and Azizi (2013)
The impact of policies of land use in shape of public transport model, the impact of these two methods on residential environment	The population density, access to public transportation, land use	Residential choice	Cooper et al. (2001)
Quality of urban life is the concept for solving the problems of urban areas, control and prevent environmental degradation	Urban life, economic, social and ,political mobility	Quality of urban life for a neighborhood	Hamamseragel et al. (2013)
Using logit model to evaluate the residents' satisfaction with the traditional neighborhood and research shows that satisfaction with traditional neighborhood residents is more than other and in this study it is concluded that the most important features of satisfaction for the neighborhood residence is attractive appearance, safety. Any initiated plan of neighborhood depends on attracting residents		Neighborhood satisfaction in suburban and traditional environments: characteristics of effective assessment in Eight neighborhoods, California	Kristin et al. (2010)

Table 3. Cont'd

In this study, using a linear regression model to assess the characteristics of residential satisfaction and the results illustrate that the majority of residents are not so happy with component such as supportive services, public facilities, community and neighborhood facilities.	Supportive services, public facilities, community and neighborhood facilities	Satisfaction assessment in design of new and low-cost public housing, Kuala Lumpur, Malaysia	Mohit et al. (2010)
This paper explores the inequalities of the following three aspects: residential, housing property and residential satisfaction by using the multiple linear regression model and the results show that inequality in the residential .environment is based on income in Dalian City		Inequalities in residential environment and satisfaction of citizens, Dalian City, China	Li et al. (2013)
This research evaluates the residential satisfaction in public housing, which is considered in three different categories: 1)people with high-income 2) people with average income 3) people with low income And the multiple linear regression Model is used to analyze it. And the results show that residents are dissatisfied with their housing conditions and residential satisfaction and the quality of life for residents of low and moderate income will be increased through the provision of basic social amenities and infrastructure facilities in public housing projects.		Assessment of residential satisfaction in public housing, Nigeria	Eziyi and Egidario (2013)
In this study, the multiple linear regression Model is used to assess residential satisfaction that is The results of .an important part for the person these studies have shown that residential satisfaction, affected the personal characteristics and residential aspects (environment)		The impact of differences in residential satisfaction	S.J.T. Jansen (2014)
The analysis of these features were performed through Spearman correlation and multiple linear regression, the findings confess that the majority of residents while enjoy the facilities and services at a high level but almost are unhappy.	Socio-demographic background, physical characteristics of the housing units, social environment, public facilities, social environment	Assessment of residential satisfaction with public housing in Maldives	Mohit and Azim (2012)
The aim of this study is to identify criteria for residential satisfaction and housing benchmarking which is needed in the overall planning of an area that has been assessed by the Cross-sectional study and results show that satisfaction criteria of resident area including housing design, public facilities, social security and interaction are non-physical criteria.		Residential satisfaction of middle-income population (case study: Madan-Qhazvin)	Dwira and Abdul (2013)
In this study indicators that are intended to assess the performance of housing development were analyzed by statistics and the results show that the quality of physical characteristics is essential through the housing environment		Assessment of residential satisfaction in Lagos, Nigeria reviews and suggestions to improve housing	Adesoji (2012)

Source: Authors

Kerman old context plan (Table 4). New urban development of the city of Kerman is divided in 2 phases,

Table 4. Variance analysis of regression model between economic, social and cultural homogeneity of residents and life quality.

P	F	R2	R	Average Square	Freedom Degree	Total Square	Changes Source
				15.89	3	47.66	Regression
0.001	6.84	0.051	0.226	2.32	380	882.88	Remaining
				-	383	930.55	Total

Figure 1. Kerman areas division based on growth and urban development.

from 1335(1955-56) to 1364(1985-86), when the master plan of the city was approved in the General Council of Architecture and Urbanism and the directions are clear about the overall development of the city. It should be noted that the construction of Mehr housing has been in place since 1385(2005-6) in the old context of the city. The fifth category of the urban context contains 2 rural contexts, Sarasiab and Mohammad Abad. Due to the development of the city on the boundary of this village in recent years, they have been introduced as part of the urban fabric.

It should be noted at the beginning of the study, 50 questionnaires containing of 35 questions were asked in the study area in experimental way. According to experts' opinion and professors at Social sciences, the study was modified and final 40 questions on a Likert collection were asked again.

The questionnaire consisted of 193 female population (50.26%) and 191 (49.74%) males, totally 400 people; 69.3 of them were married and 30.7% were singles (Figure 1).

The statistical population of samples and sampling method

The statistical population of research consisted of all citizens living in the city of Kerman (534,441) according to the population and housing census of 2011.

In this research, the required sample size is equal to 384 people by Cochran'formula and used method in order to study were *randomly – classified* method according to selection size of different stages of urban development is expressed as,

$$n = \frac{Nt^2 pq}{Nd^2 + t^2 pq} \quad n = \frac{513063}{1337.06} = 384$$

N=534441 q=0/50 P=0/50 $\alpha = 0/95$ $z_{\frac{\alpha}{2}} = 1/96$ *d*=0/045

Research achievement

To measure and prove the hypothesis, indicators related to each part of hypothesis are tested and their relationship through '*Pearson'* correlation and '*Linear regression'* model are analyzed. To demonstrate the effects of social, cultural and economic homogeneity on life quality, the results of this homogeneity are also presented.

The main hypothesis (1)

There is a relationship between social, cultural and economic homogeneity of residents and the life quality of that area.

Linear relationships between economic homogeneity (shown by X1), cultural homogeneity (shown by X2),

Table 5. Coefficients of Regression model between economic, social and cultural homogeneity of residents and life quality.

Criterion variable	Predictor variables	β	T	Significance level
Life quality	Economic homogeneity	0.05	0.767	0.444
	Cultural homogeneity	0.055	0.835	0.404
	Social Homogeneity	0.17	3.11	0.022

social homogeneity (shown by X3) and life quality (shown by X4) are determined by '*linear Regression'* model:

$Y = \beta 0 + \beta 1\ X1 + \beta 2\ X2 + \beta 3\ X3 + \varepsilon$

In this model, to determine above relation, statistical hypotheses are:

H0: The model is linear Regression.
H1: The model is not linear Regression.
H01: $\beta 1 = 0$ H02: $\beta 2 = 0$ H03: $\beta 3 = 0$
H11: $\beta 1 \neq 0$ H12: $\beta 2 \neq 0$ H13: $\beta 3 \neq 0$

Since the calculated P value from test (0.001) is less than significant level (0.50) in this area, H0 is rejected and the result is a meaningful linear regression model (Table 1). It means there is a significant linear relationship between the economic, cultural, social homogeneity of residents and their life quality. Multiple correlation coefficient (r) is equal to 0.226, which represents the relationship between the economic, social and cultural homogeneity of residents with life quality. Due to the R value, that is equal to 0.051 then the economic, social and cultural homogeneity of residents explain the variance of 5.1% of life quality; that is to say the economic, social and cultural homogeneity of local residents had 5.1 percent impact on the quality of life.

According to multiple regression coefficients with Procedure of simultaneous entry and gained regression coefficients it is concluded that the social homogeneity of life quality can be significantly predicted, but through the economic and cultural homogeneity at the same time cannot predict significantly life quality (Table 5).

How much is the economic homogeneity of the citizens?

According to the results of data analysis, about 6/39 percent (152) of respondents were economically heterogeneous and around 4/60 percent (232 people) are homogeneous (Table 6).

How much is the cultural homogeneity of the citizens?

According to the results of data analysis, about 40.9 percent (157) of respondents were culturally heterogeneous and around 59.1 percent (227people) are homogeneous (Table 7).

Table 6. The distribution of economic homogeneity.

Economic homogeneity	Distribution	Percent
Heterogeneous	152	39.6
Homogeneous	232	60.4
Total	384	100

Table 7. The distribution of cultural homogeneity.

Cultural homogeneity	Distribution	Percent
Heterogeneous	157	40.9
Homogeneous	227	59.1
Total	384	100

Table 8. The distribution of social homogeneity.

Social homogeneity	Distribution	Percent
Heterogeneous	140	36.5
Homogeneous	244	63.5
Total	384	100

How much is the social homogeneity of the citizens?

According to the results of data analysis, about 36.5 percent (140) of respondents are socially heterogeneous and around 63.5 percent (244people) are homogeneous (Table 8).

The main hypothesis (2)

There is a relationship between neighborhood services and quality of life. Data analysis shows that the correlation coefficient Pearson between neighborhood services and quality of life is equal to 0.291 with (significantly) amount of 0/001 smaller than significant level of 0.05. At this level the H_0 hypothesis is rejected and it is proved there is a significant relationship between

Table 9. Statistics of Pearson correlation test relating to the relationship between neighborhood services and quality of residence.

Variable	Quality of residence					
Test	**Pearson**			**R_2**	**Relation**	**Relation type**
Neighborhood services	**Correlation coefficient**	**Significant amount**	**Number**	0.084	YES	Direct
	0.291	0.001	384			

Table 10. Statistics of Pearson correlation test relating to the relationship between social interactions and quality of residence.

Variable	Residence quality					
Test	**Pearson**			**R_2**	**Relation**	**Relation type**
Neighborhood services	**Correlation coefficient**	**Significant amount**	**Number**	0.059	YES	Direct
	0.244	0.001	384			

Table 11. Statistics of Pearson correlation test relating to the relationship between neighborhood services and social interactions.

Variable	Residence quality					
Test	**Pearson**			**R_2**	**Relation**	**Relation type**
Neighborhood services amount	**Correlation coefficient**	**Significant amount**	**Number**	0.005	NO	----
	0.075	0.144	384			

neighborhood services and quality of life. In addition, a positive correlation coefficient indicates a direct relationship between these two variables. It means as much as more neighborhood services exist, the residence quality will be better. The determination coefficient between two variables is equal to 0.084 (R^2 = 0.084), that is 8.4% of the residence quality changes due to neighborhood services , or with neighborhood services can improve the residence quality by 8.4% (Table 9).

Secondary hypothesis 1: **Is there any relationship between social interaction of citizens and quality of life?**

Data analysis shows that the correlation coefficient Pearson between social interaction of citizens and quality of life is equal to 0.244 with (significantly) amount of 0/001 smaller than significant level equal to 0.05. At this level, the H_0 hypothesis is rejected and it is proved there is a significant relationship between interaction of citizens and quality of residence. In addition, a positive correlation coefficient indicates a direct relationship between these two variables. It means as much as more existing interaction of citizens, the quality of residence will be better. The determination coefficient between two variables is equal to 0.059 (R^2 = 0.059), i.e.5.9% of the quality of residence changes due to social interactions, or with social interactions can improve the quality of residence by 5.9% (Table 10).

Secondary hypothesis 2: Is there any relationship between the neighborhood services and the social interaction of citizens?

Data analysis shows that the correlation coefficient Pearson between the neighborhood services and the social interaction of citizens is equal to 0.075 with (significantly) amount of 0.144 smaller than significant level equal to 0.05. At this level, the H_0hypothesis is rejected and it is proved there is not a significant relationship between the neighborhood services and the social interaction of citizens. In addition, a positive correlation coefficient indicates a direct relationship between these two variables (Table 11).

Conclusion

From the result of the study, the underlying assumptions like the impact of social, economic and cultural homogeneity and role of neighborhood services for improving the quality of housing are determined. From each of the secondary hypotheses of the research, that is, the subset of the main hypotheses, the relationship between social interactions and quality of life is proved, but the results did not demonstrate any relationship

between neighborhood services and increase of social interaction. It can be concluded that the same level of social classes impact people's mental comfort as well as social interaction, which lead to improvement in the quality of the residential environment. On the other hand, access to the neighborhood services increases citizen's comfort objectively, leading to the improvement of environmental quality, but these services do not increase social interaction in areas such as centers of old neighborhoods. It can be suggested that by improving the quality of urban spaces in services and facilities centers and promoting social interaction could help increase the quality of life in urban areas. Also the creation of homogeneous neighborhoods in terms of socio-cultural classes will increase spiritual security, reduce mental stress of citizens and also promote the quality of life. These will lead to increased uniformity, social interactions and cultural exchanges which are considered as effective solutions. And these events will be possible in public spaces of the neighborhood service centers.

Conflict of Interests

The authors have not declared any conflict of interests.

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Full Length Research Paper

Nature of home based enterprises (HBEs) in Aba, Abia State, Nigeria

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Major sources of employment and income generation for urban residents in Nigeria and most other developing countries are found in what is referred to as Home Based Enterprises (HBEs). In Nigeria, a wide range of economic activities fall within these enterprises. These enterprises provide residential neighbourhoods with a range of services. The HBEs face a number of operational problems. Using data from Aba, the major economic centre of Abia State, Nigeria, the paper demonstrates the heterogeneous nature of HBEs, highlights their job creation potential and shows that about 61% of the operators dispose of solid waste generated by their enterprises through other sources outside government waste collection containers.

Key words: Retailing and provision store, electrical repair shop, employment generation.

INTRODUCTION

Home Based Enterprises (HBEs) are generally seen as those micro and small enterprises where trade takes place in or very close to residential or the home rather than in a commercial or industrial building or area (Tipple, 2005). Some HBEs have both a home based component (that is, making food) and non-home based component (e.g. selling food in the street). It needs to be recognized here that the former is regarded as a production HBE, while the later is not retail HBE, but instead a non-home based activity to which the HBE contributes. In the same vein, a three wheeled tricycle (Keke or Tuketuke) driver or a commercial motorcycle rider who keeps his vehicle in the house at nights (after the day's business) is not an HBE. Fass (1980) noted how important home storage may be for many enterprises, but in this work, such storage was not recognized as an HBE in its own right. In addition, while renting out rooms to other people may be seen as one of the most important methods of earning money using the home in the urban areas of Nigeria and other developing countries, however, renting does not represent a change of use from residential, a fundamental aspect of the whole concept of HBEs. Thus, renting rooms within a residential building is not expected to affect the dwellings or neighbourhoods as other non-HBEs do. Therefore, it was not recognized in this work, renting of rooms as a HBE. Nappier et al. (2000) noted that generally, some HBE operations negatively affect their neighbours, while Tipple et al. (2002) observed that HBEs generate some dangerous and unpleasant substances in their operations.

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Theoretically, the study of HBEs rests on three positions in academic and policy circles. The first is the changing perception on poverty and the poor. Poverty is often perceived by the classical thought narrowly, as a lack of income and the poor, as a homogeneous group of rather passive victims. However, by the late 1990s, alternative views began to emerge, which acknowledged the complexity and diversity of the poor and poverty. These views were based on an actor-oriented perspective focusing on the activities people undertake to sustain and change their lives often in difficult situations. A second position revolves round the acceptance by planners and housing experts that habitat is more than a consumptive asset and must include productive activities strongly integrated into the domestic and reproductive sphere of the household. Thirdly, is the view from neo-liberal positions in development and actions which accepts entrepreneurship as an important tool in poverty reduction. Thus, poor people should therefore be encouraged to develop their entrepreneurial skills and nurture enterprise with government removing inhibitions that constrain the emergence of such entrepreneurial activities (Verrest, 2007).

Lawanson and Olarenwaju (2012) see HBEs as income generating activities which take place within a dwelling and their broader physical context. By this definition, the arrangement of spaces that may be involved in the activities of HBEs include, the dwelling (house), the courtyard, the street (immediate to the given house) as well as the broader neighbourhood and available spaces. This is a rather wide definition but captures the physical spaces within which HBEs operate in Nigeria and most urban areas of the developing world.

The literature on the HBEs in the urban areas of the developing world and not only in the developing countries is quite extensive. However, emphasis has been on the employment generating potential of HBEs in Asia and Africa. Surprisingly, not a lot of research effort has been done on this rather prevalent set of enterprises in Nigeria, the biggest country (in terms of population) in Africa. Kellet and Tipple (2000) draw on a pilot study into the housing implications of home based enterprises in a squatter settlement in New Dilhi, India. Napier and Mothwa (2001) writing on Pretoria, South Africa examined the assumption that HBEs could be an endless provider of employment. Mahmud (2003) explored the potential of women and domestic spaces in the ‘bustees’, and how they are involved in economic activities in Dhaka, Bangladesh. Gough et al. (2003) in their study of Accra and Pretoria noted that in the two cities, HBEs are widespread, provide an important place of work especially for women and contribute significantly to household incomes. Mason et al. (2008) noted that in the UK, as at 2005, home based businesses accounted for 36% of all businesses.

Coming to Nigeria, not many works are available in the literature on home based enterprises in the urban areas of the country. One of the earliest available efforts is that by Onyebueke (2001). This work noted that HBEs were neglected in official circles, without well defined guidelines and strategies for dealing with their activities. Lawanson (2012) examined the major characteristics and effects the HBEs have on urban planning in Lagos Metropilis, Nigeria, concluding that about 45% of operators of these enterprises relied solely on the home based enterprises for sustenance, while about 19% of the operators of HBEs are employed in other means of employment. Lawanson and Olanrewaju (2012) in their work on HBEs in the low income residential areas of Lagos Metropolis identified the importance of the HBEs as a major source of income generation and socialization. Abolade et al. (2013) investigated the impact of HBEs on the quality of life of residents in Ibadan, North Local Government Area of Oyo State, Nigeria, noting that operators of these enterprises were satisfied with their activities. Baba et al. (2015) writing on HBEs as typified by automobile repair artisans, noted the exclusiveness suffered by these activities with no purpose built workplaces.

While the efforts of the aforementioned researchers were commended on the work done in Nigeria, it is pertinent to note that for a country with an estimated urban population of about 85 million (World Bank, 2014). These efforts should be seen as a drop in the ocean of work needed in the area of home based enterprises in the country. This paper therefore attempts to add to the aforementioned knowledge on HBEs in Nigeria in a number of areas. So far no work has been done on HBEs in Aba, a major commercial city in Nigeria; this paper tries to remedy that. The aforementioned efforts seem not to have effectively captured the heterogeneous nature of home based enterprises in the urban areas of Nigeria or provide a mechanism for assessing the employment generated by the HBEs. This work attempts a remedy to this weakness. Another justification for this study is to identify some of the operational problems which the HBEs face. As an economic activity possible negative consequences are bound to emerge and this paper examines ways which the HBEs have adopted to dispose of generated solid waste.

This paper is divided into four parts. The first is the introduction which attempts a definition of HBEs and provides a review of available literature on the subject across the world and certainly in Nigeria. The second part of the paper is a brief description of the area of study. The third part of the paper is the methodology. The fourth part of the paper is the discussion of results from analysis of data drawn from the area. The fifth and final part of the paper is the conclusion.

Case study area

Aba is a city located in the southeastern part of Nigeria.

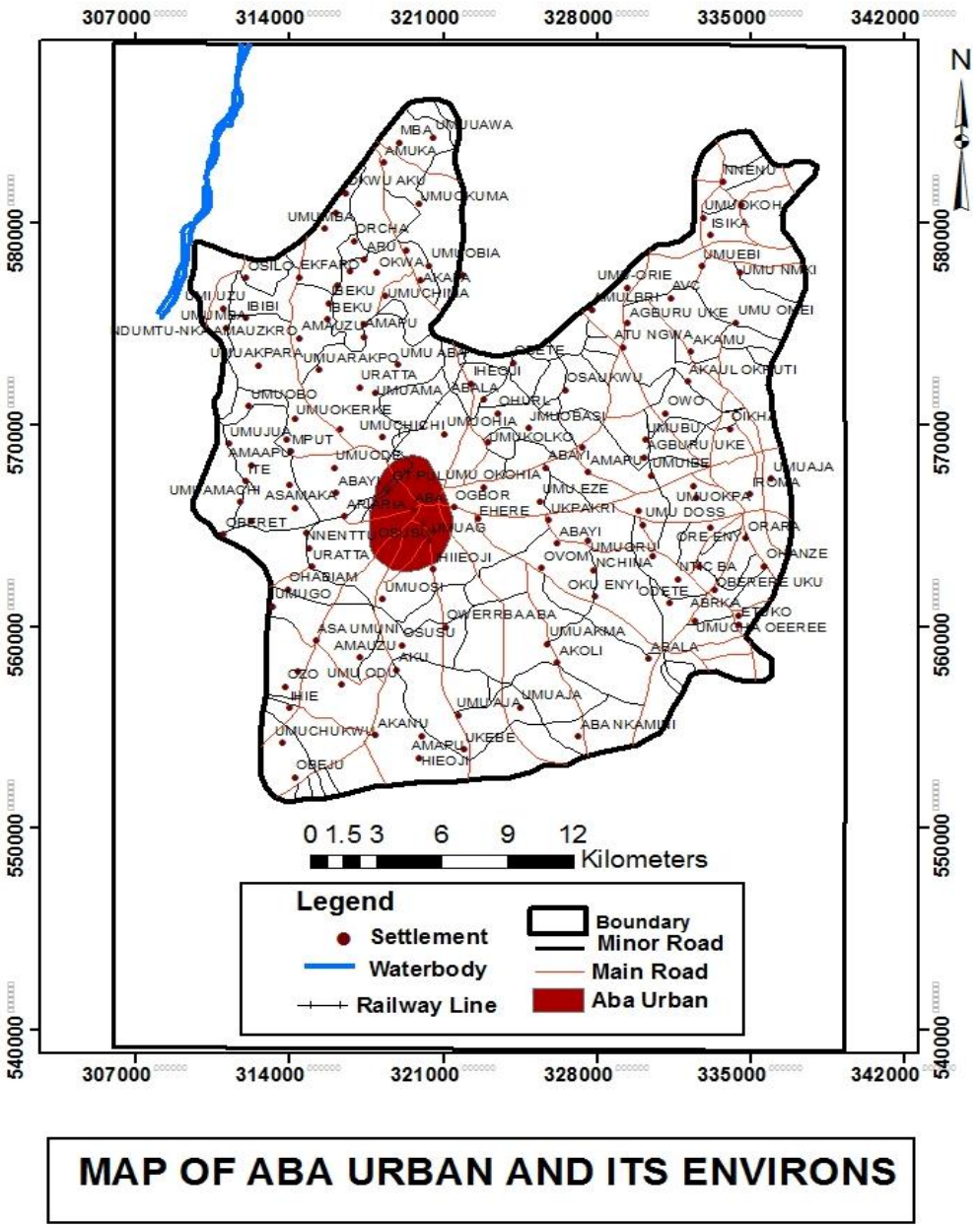

Figure 1. Map of Aba Urban and Environs.

Figure 1 is a map of Aba urban and its environs. The coordinates of Aba urban using the Universal Transverse Mercator (UTM) system are 318944 Easting and 564869 Northing. The urban area of Aba is the main trading and commercial center in Abia State, Nigeria. The main urban area of Aba falls within two local government areas of Aba South and Aba North. The urban area of Aba is bounded to the west and north by the communities of Osisioma, with the communities of Obingwa to the east and Ugwunagbo communities to the east. Aba South is the main city center and the economic heart beat of Abia State. As at 2010, Aba had a projected population of about 836,000 persons (United Nations, 2012). The commercial status of Aba provides a significant justification for the choice of the town for a study of this nature on the operation of home based enterprises.

MATERIALS AND METHODS

The research design adopted for this study is largely quantitative, to generate quantitative data about the operations of the HBEs; in the form of a sample survey of the target population under study; that is operators (owners) of home based enterprises. The data collection instrument is fully structured questionnaire. This is informed by the

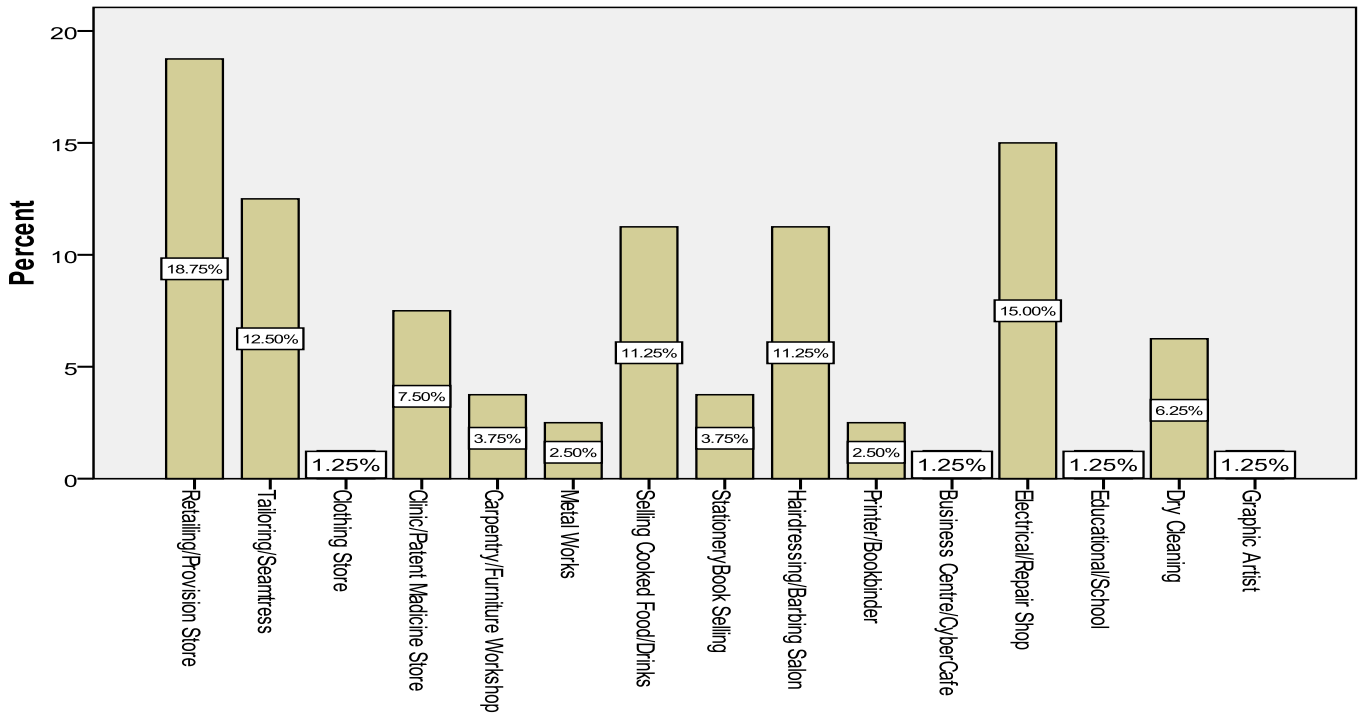

Figure 2. Types of HBEs in Aba Urban.

need to generate numerical values for the variables to help determine the socio-economic characteristics of the operators of the HBEs in the residential neighbourhoods of Aba urban, and the use of quantitative research design approach by other researchers who have studied similar process in other parts of the world (Napier and Mothwa, 2001; Gough et al., 2003; Mason et al., 2008; Lawanson and Olanrewaju, 2012). To achieve standardization of data collection instruments adopted, structured standardized questionnaires were used in the collection of data for this work. Creswell (2003) and Punch (2005) inform the choice of this approach. All the questionnaires consisted of pre-prepared questions, with a set of answers from which the respondents had to choose. The main advantage of this approach is its ability to achieve reliability and comparability of measurements. Another advantage of this approach is the standardization it brings to bear on the survey since field assistants were used in the survey exercise.

The residential neighbourhoods in Aba urban sampled to obtain data for the purposes of this study and the numbers of HBE owners (Operators) are: Ogborhill Residential Neighbourhood with 27 HBE operators sampled; Amamuong (Ngwa Road) Residential Area with 33 HBE operators sampled and Eziama Residential Area with 20 HBE operators sampled. These neighbourhoods appear to have the largest concentration of HBE operators in the area under study.

The simple random sampling method adopted was because of its unbiased attribute to obtain data from the operators of the home based enterprises. With no frame of operators of home based enterprises in the residential areas of Aba urban, field assistants were employed to move around the residential neighbourhoods of the area sampling operators of HBEs working in residential buildings they visited. The field assistants read out (face-to-face interview) the fully structured questionnaires to the operators of the home based enterprises that were present at the time of the visit and ticked off the domain responses. The exercise was conducted over a period of six weeks. A total of 80 respondents were sampled using simple random approach, to obtain the data for this research in the residential neighbourhoods of Aba urban, Abia State, Nigeria. Collected quantitative data was analyzed using the Statistical Packages for the Social Sciences (SPSS) version 17 to generate tables and to rank variables, using Friedman test a Non Parametric technique.

RESULTS AND DISCUSSION

Analyses of obtained data showed a wide broad of activities and trades operating as home based enterprises in Aba urban, Abia State. Figure 2 provides a breakdown of the types of enterprises operating from homes as HBEs in the area of study. It shows that almost 19% of the HBEs are in Retailing and Provision stores. These serve as corner shops where residents come to purchase basic-day to-day needs such as bread, milk and sugar. These reaffirm the conclusions by Tipple (2005) and Lawanson and Olarenwaju (2012

The second highest group of HBEs is the electrical repair shops, where residents go for the repair of their electrical appliances such as electric fans, radio and television sets and sell of spare parts. Other enterprises and trades include tailoring and seamstress, hairdressing and barbing salon, selling of cooked food and drinks, Clinics and Patent Medicine stores as well as educational activities. On the whole, a total of 15 separate trades and activities are captured in Figure 2 as a demonstration of

Table 1. Mean sum numbers of persons employed by HBEs in Aba Urban.

Valid Number	80
Missing	0
Mean	2.275
Sum	182.0

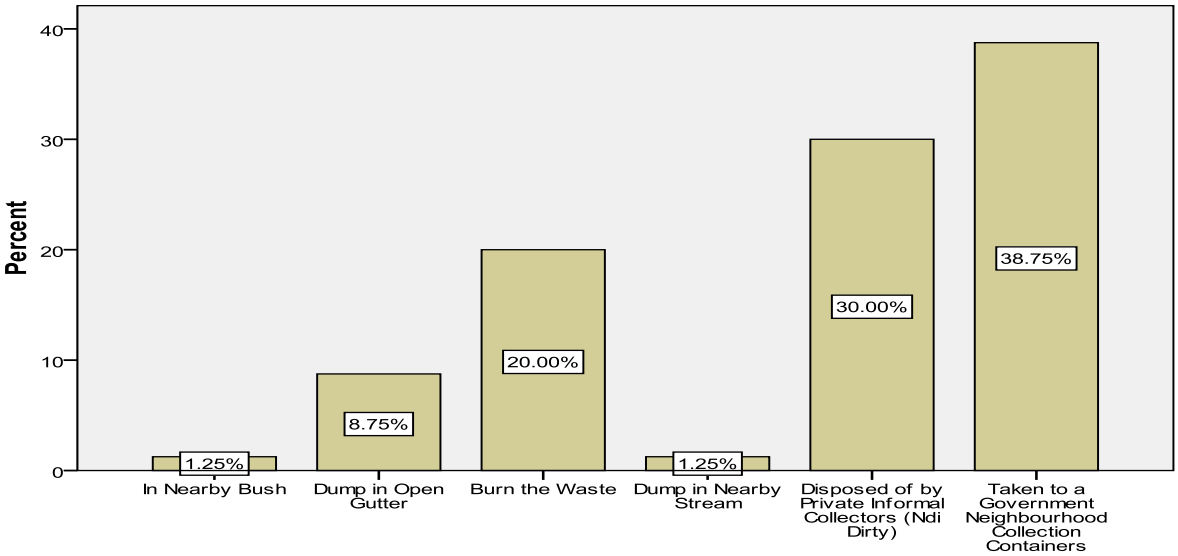

Figure 3. Disposal of generated solid waste by HBE operators in Aba Urban.

the range of HBEs in the residential neighbourhoods of Aba urban. This range of trades and economic activities demonstrates heterogeneous nature of the HBEs, inherent entrepreneurial skills and innovativeness in the operations and within the operators of the home based enterprises that need to be supported and encouraged.

One other important area of interest about HBEs, the world over is the argument on the contribution to the urban economy through the employment created by these trades and activities. Table 1 shows that the mean number of persons employed by HBE operators from collected data in Aba urban is just about two persons. The data shows just the numbers employed in addition to the operator. Thus, it is the operator and an additional two employees on the average per HBE operation. This may not sound fantastic or impressive going by the often stated potential the HBEs have for employment generation. However, the potential magic the HBEs seem to have in creating employment for urban residents particularly the urban poor is in the large numbers of HBEs spread across the residential neighbourhoods of our urban areas. Home based enterprises in the cities and towns in the developing countries including Nigeria run into hundreds and thousands. When we multiply these with the mean number of employees per HBE, we begin to see the real contribution and impact these enterprises have in employment creation particularly for those who seem not to have alternative areas of employment. This is where the strength of the HBEs lies as far as employment creation is concerned. The HBEs may not also score very highly in terms of wages paid employees compared to workers in government employment and employees in multinational establishments. For the urban unemployed who have been in search of employment for years, the little amount paid serves as an important stepping stone in the employment ladder but more importantly, however, is that the employees have something doing no matter how small or meager the wage.

That home based enterprises are a significant aspect of urban life in the cities and towns of Nigeria and many others areas of the developing world is no longer in doubt. So far, we have been able to demonstrate the heterogeneous nature of these enterprises in Aba urban Abia State, Nigeria. We have equally shown the potential these activities have in employment generation. However, we must not fail to examine some of the other aspects of these enterprises; after all, operators of the HBEs carry out their activities in areas ordinarily set aside not for commercial activities, and in the process generate solid waste. Figure 3 shows a breakdown of how generated solid waste in the course of the operations of

Table 2. Operational problems faced By HBEs In Aba Urban

Variable	Ranks	Means
No operational problems	4	1.00
Erratic power supply	1	3.69
Funds to expand business	2	3.26
New recruits to join HBEs	3	2.05

N: 80, Chi square: 213.315, df-3, Asymp. Sig 0.000

the HBEs is disposed. From Figure 3, about 39% solid waste generated by the HBEs is taken to government neighbourhood collection provided by government agencies to serve households who ordinarily reside in the area where these containers are located. It should be noted however, that the government agencies that provided these waste collection containers may not have made provision for the waste generated by the HBEs operating in the area. Figure 3 also more importantly, indicates that about 61% of the sampled HBE operators disposed generated solid wastes either through private informal collectors, burning the waste or dumping wastes in the gutters. This latter problem is a major consequence and not positive, compared to the employment generated by the HBEs, but rather a negative one emanating from the activities of the HBEs in residential areas. These reaffirm the findings by Nappier et al. (2000).

Having examined some of the positive and negative consequences of the activities of the home based enterprises in Aba urban, Aba State Nigeria it is pertinent to note that development activities generally are riddled with good and not so good sides. Efforts must be made to maximize the positives and as much as possible minimize the negatives. In this vein there is need to consider some of the challenges and problems the operators of home based enterprises sampled in Aba indicated to be those that need to be overcome for improvement in their entrepreneurial and job creating activities. Using the Friedman Test, a Non Parametric statistic, Table 2 shows the means and ranks of the responses given by the operators of the home based enterprises as the operational problems they face. Erratic power supply has the highest mean rank of 3.60 followed by Funds to expand their businesses. The new recruits (labour to be employed) variable comes third. The challenges to businesses in Nigeria by erratic power supply and funding thus are not peculiar to the very large enterprises. The micro and small scale businesses also face these difficulties and many would argue that they are the hardest hit by these problems.

Conclusion

HBEs have become significant features of the landscape in the residential neighbourhoods of Aba urban, Abia State, Nigeria. Operators of these enterprises have demonstrated entrepreneurial skills and their activities cover a wide range of economic activities. Residents in the neighbourhoods patronize the HBEs to cater for their day-to-day needs. In the process, HBEs have equally contributed to the urban economy through providing employment to a large number of urban dwellers particularly the poor who may not have other means of employment. It must however be noted that the potential which the HBEs have in employment generation is in the very large numbers of these enterprises operating in all urban residential neighbourhoods in Nigeria. In the absence of alternative means of employment it is suggested that the operating difficulties faced by the HBEs be looked into on both the demand and supply sides. However, every economic activity has its flip side. For the HBEs sampled in this study, a much larger percentage of the operators dispose generated solid waste outside government provided neighbouhood waste collection containers. This aspect of the negative consequences of the operations of the HBEs needs to be examined by the relevant waste collection and disposal agency in Abia State, Nigeria for possible remedy.

Conflict of Interests

The authors have not declared any conflict of interests.

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Full Length Research Paper

Fragmentation rate and landscape structure of the Tillabéry landscape (Sahel region) with reference to desertification

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This paper sought to investigate and monitor desertification processes in the Tillabéry landscape (Sahel). To achieve this aim, it employed a landscape metrics approach. The usefulness of landscape structure was investigated in the context of desertification. A set of indices was selected to investigate multi-temporal change in the Tillabéry landscape affected by desertification. The percentage of land indices showed a decrease in plateau vegetation. Water bodies increased between 1973 and 1989 but later recorded a 50% decrease. The indices further revealed an increase in bare soils. Shrubs increased between 1973 and 1989. This increase can be attributed to reforestation activities. The results further revealed that the Tillabéry landscape has a high number of patches and patch sizes are very small, indicating that the original landscape is increasingly being converted into bare areas and agricultural fields, thereby accentuating the issue of land degradation in the region.

Key words: Landscape metrics, desertification, remote sensing, Tillabéry landscape.

INTRODUCTION

Developments in agriculture, urbanisation and mining coupled with a decrease in rainfall events have led to losses in biodiversity and land degradation, resulting in desertification in the Sahel. Human activities and natural processes in the Sahel have permanently changed the ecosystem, with a resulting impact on the land cover and land use potential (Turner et al., 1994) and invariably the attractiveness of the landscape. Changes in the landscape of the region are apparent and can also be perceived directly. Such changes have been associated with a variety of factors ranging from biodiversity losses (Herrman et al., 2005); negative socio-cultural impacts; loss of soil quality; dramatic and unprecedented land use and land cover dynamics and lately, to global climate

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change (Pielke et al., 2002).

Several conservation and development studies point to the fact that land degradation and desertification are a result of land use in the Sahel area, which is closely linked to demographic conditions (Forman et al., 2003; Amogu et al., 2010). However, lack of reliable data and survey information in some countries, have made the estimation of areas of intact desert and / or areas of land cover change and their relationship with economic indicators difficult to establish. Consequently, the extent and rate of desertification in the Sahel are less well known than in other regions of the world. The effects of desertification and land degradation in the Republic of Niger are so overwhelming in terms of the dramatic changes that the landscape has undergone within the last 40 years (Amogu et al., 2010; Mahamane et al., 2015). They span every aspect of human life in the area. It aggravates poverty conditions; decreases land productivity; increases the aridity of the climate; food insecurity and further induces diseases and malnutrition. It has led to the disappearance of certain herbaceous and ligneous plants used in traditional pharmacy (Mahamane, 2013). To compound it, it has led to an acute reduction in groundwater and merits urgent attention and action.

Government officials are aware of a degraded environment in the Sahel. This explains why planting of trees is a major part of the activities on the 3rd of every August (Independence Day of Niger) in Niger. However, there is inadequate research that quantifies environmental degradation processes in the Sahel Region of Niger. This research makes use of remote sensing data in the form of a time series analysis (1973, 1989, 2001 and 2007), which in effect gives the work an historical touch and provides quantitative information on the nature of environmental change and provides additional knowledge in understanding the phenomenon of land degradation in the Sahel region at large.

Quantifying fragmentation is important to identify land degradation (Schlesinger et al., 1990). The fragmentation processes are the division of continuous land cover into smaller patches which can be linked to three parts: direct removal, reduction in patch sizes and increasing isolation of the remaining patches (Nagendra et al. 2003). Nagendra et al. (2013) argued that landscape fragmentation that emanates from the interaction between anthropogenic and natural disturbances has a negative influence on species dispersion, species mortality, decreases landscape connectivity, and reproduction rates.

Wu et al. (2000) reported that the evidence of fragmentation or degradation of local vegetation cover has been documented in many regions of the Sahel over the past decades. Much of this degradation is attributed to drought and climate change.

Notwithstanding, increases in human and livestock population have aggravated the problem of land degradation in Niger. This is a precursor to the desertification process and results from the investigated landscape metrics for the years 1973, 1989, 2001 and 2007 is depicting this trend in the Tillabéry landscape in Niger. As such, the fragmentation of the landscape due to desertification has had rigorous ecological consequences. This has contributed greatly to the loss in species diversity (due to the segregation of habitats and to the division of populations). It has also affected the quantity and quality of water in the area. The phenomenon of desertification in the Sahel is a complex one, which necessitated the formulation of one key objective in this research – to apply a landscape metrics approach in an historical context to understand land degradation and desertification in the Tillabéry landscape.

METHODS

Overview of the study area

This research was carried out in the Tillabéry region, West Niger, located at 13º 30´N and 15º 45´N latitude, 0º 10´E and 4º 20´E longitude. The region is composed of six districts, namely: Fillingue, Ouallam, Tera, Kollo, Say and Tillabéry covering an estimated area of 91,199 km² (7.19% of the total area of Niger). The study area is located as shown in Figure 1, within the departments of Tillabéry, Tera, and Ouallam and includes part of the wide valley of the Niger River. It covers approximately 21,328 km² (23.39% of the total area of the Tillabéry region) and the annual precipitation is between 250 mm and 400 mm. The soil in this area is dominated by loam soils and is very infertile and poses enormous challenges for agricultural production (Mahamane, 2015). This area was selected due to the fact that desertification is the most serious environmental problem in the area. A situation that is made more important when one considers the fact that the depth and breadth of River Niger is continuously on a decrease, an issue associated with the moving of sand.

Data and analysis

Landscape metrics

Primary data used in this work are: Landsat Multi-spectral Scanner (Landsat MSS), with a resolution of 60 m, acquired in September 1973, Landsat Thematic Mapper (Landsat TM) with a resolution of 30 m acquired in September 1989 alongside a Landsat Enhanced Thematic Mapper Plus (Landsat ETM +) with a resolution of 30m acquired in September 2001. Added to this is a Landsat TM image with a resolution of 30 m acquired in September 2007. The Landsat MSS image was resampled (Majority algorithm was selected) to a resolution of 30 m in order to standardize the resolution of the different images. These were the primary sources of data (Table 1). The month of September was selected because it is the peak period in the rainy season, which makes it possible to have a more accurate extent of the vegetation cover in the Tillabéry area. Also, only September was selected to avoid the influence of inter and intra-seasonal fluctuations in the Tillabéry landscape.

With regards to classification, a supervised classification technique was used in classifying all the images and maximum likelihood algorithm using Erdas imagine was selected in order to generate the land use and land cover of the landscape. The Landsat MSS image of 1973 had an accuracy assessment of 83%

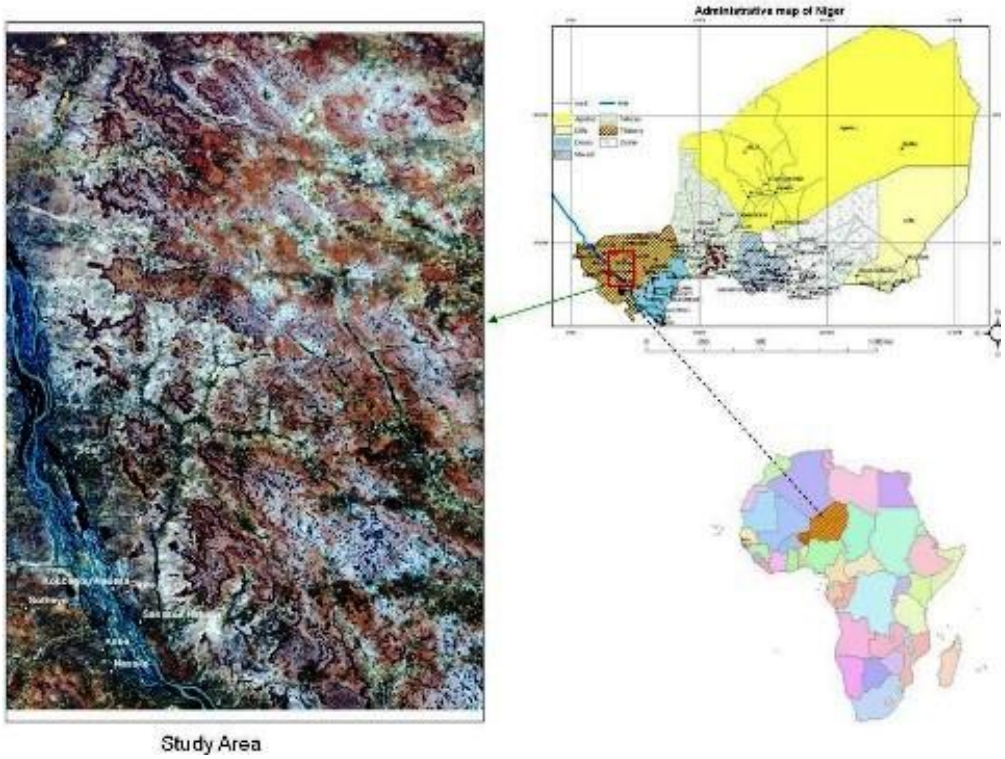

Figure 1. Map of Niger, its location in Africa and the study area.

Table 1. Data used.

Landsat	Date	Pixel (m)	Number of Bands	Scene identification
MSS	1973-09-30	60	4	EMP298r49_3m19730913
TM	1989-09-17	30	7	P193r50_4t890917
ETM+	2001-09-18	30	7	P193r050_7t20010918
TM	2007-09-27	30	7	LT51930502007270MPS00

and the Landsat TM image of 1989 had an accuracy assessment of 91%. The Landsat ETM+ image of 2001 and the Landsat TM image of 2007 both had accuracy assessments of 92% and 90% respectively. Landscape metrics were used to investigate landscape changes over time from 1973 to 2007. In order to calculate landscape metrics indices, land use and land cover maps were converted into Grid formats using ArcGIS 9.3.1 and integrated into the FRAGSTATS software (version 3.3).

Many indices have been used to describe landscape structure in order to investigate the effects of land degradation and desertification. McGarigal and Cushman (2002) and McGarigal and Cushman (2005) have provided a detailed definition of these indices. The selected metrics that appear in this work were chosen because of their ability to capture the changing pattern in spatio-temporal change with regards to the composition and configuration of landscape elements, which together offer a comprehensible overview of the changes in the landscape both at the class and at the landscape level. A square moving window analysis with a 60 m side length was chosen to create a continuous landscape metrics index for statistical analysis. The size of the moving window was chosen because the original images had a 30 m pixel size and a 60 m window will present a logical output (without exaggerating or minimizing) the composition and configuration of landscape elements.

Landscape composition

The indices selected for describing landscape composition at the class level, which are suitable to capture desertification were: Percentage of Land (%LAND) and landscape level Number of Patches (NP), Total Area (TA), Patch Density (PD) and Largest Patch Index (LPI).

Landscape configuration

Landscape configuration at class and landscape level was analysed

by means of the following landscape metrics: Landscape Shape Index (LSI), Interspersion and Juxtaposition Index (IJI) and Mean Patch Fractal Dimension Index (MPFD).

The degree of fragmentation

This index quantifies landscape fragmentation; it is based on the probability that two points chosen randomly in a region would be connected (Jaeger et al. 2007). In a bid to express the physical connectivity of the patches, as well as to capture the spatial pattern of the degree of fragmentation due to desertification at the landscape level, the inverse mesh index was developed.

Fragmentation index = $1/(\frac{\sum_{j=1}^{n} a_{ij}^2}{A})(\frac{1}{10,000})$

Where:

n= number of patches; $^{Ai}a_{ij}$ = *area (m²) of the patch ij*; A^{A} = total area of the study area investigated which has been fragmented into n patches.

The mesh index was selected because it gives information about the spatial connectivity of the landscape. Jaeger et al. (2007) reported that the mesh index is suitable for analyzing the degree of fragmentation of landscape and has already been used for case studies in Baden-Wurttemberg, Bavaria, Hessen, Thuringia, Saxony, Schleswig-Holstein and South Tyrol. However, an inverse of this index is capable of capturing the degree of spatial fragmentation in the landscape under investigation based on the land use and land cover maps.

RESULTS AND DISCUSSION

Landscape composition metrics

Area metrics

The percent of land shows a decrease in plateau vegetation (54.78% in 1973, 20.11% in 1989, 18.07% in 2001 and 11.87% in 2007). This situation can be attributed to over grazing and an increasing trend towards arid conditions. Water on its part increased from 2.79 % in 1973 to 5.98 % in 1989. This could be explained by the fact that the preceding years (1970-1972) witnessed very low rainfall events (JISAO, 2013). However, water volume plummeted again by 50% between 1989 and 2001 (5.98% in 1989 and 2.34% in 2001) and remained the same between 2001 and 2007. This behavioural pattern of water availability is greatly tied to rainfall events, which is also highly subjected to influences from the Inter-tropical Convergence Zone (ITCZ).

This index also shows an overall increase in bare soils throughout the study period. Shrubs increased from 22.78% in 1973 to 29.34% in 1989 and decreased slightly by 2001. This pattern could be accounted for by reforestation activities and political stability and also because the period 1986 – 1988 were wetter years, providing favourable conditions for the establishment and growth of shrubs, which was easily captured by the 1989 image. Nevertheless, the percentage of shrubs on the landscape greatly decreased from 25% in 2001 to 15% in 2007 (Figure 2).

This can be explained by two factors; firstly, there was an increase in human population and a corresponding increase in the need for fuel wood as a source of energy to meet up with the energy needs of an increasing population (Charney, 1975 cited in Stephen, 2014). Secondly, there was a reported increase in overgrazing by browsing animals. This saw the percentage of bare areas increased from 10% in 2001 to 33% in 2007, resulting to land degradation and desertification in the study area.

Patch density, patch size and variability metrics

Knowledge on landscape fragmentation has considerable potentials to improve environmental management in the study area. PD, NP and LPI were calculated at the landscape level. The NP in the landscape stood at 33,678 in 1973. This figure increased significantly to 148,298 in 1989. In 2001, there was a further increase in the NP to 189.013 before drastically falling to 54,721 in 2007. The steady increase in the NP between 1973 to 2001 points to an increase in landscape fragmentation and an increasing trend towards desertification. The drop in the NP in 2007 indicates the amalgamation of many small bare areas producing larger clumps of bare areas, thereby accentuating the process of desertification in the study area. Pertaining to the PD, it was 11 in 1973. It then experienced an exponential increase to 47 in 1989. It further increased again in 2001 to 61 before falling again to 18 in 2007. This behavioural pattern of the PD shows an increase in landscape elements over time (between 1973 to 2001). The later decrease in PD in 2007 can be attributed to an amalgamation of patches, especially the class bare areas. The LPI on its part was 36 in 1973 then plummeted to 8 in 1989. It later experienced a major increase in 2001 to 20 and reduced to 10 in 2007. This indicates a trend in disintegration of the major land cover classes overtime.

Landscape configuration metrics

Shape metrics and fractal dimension

LSI is an index to measure landscape complexity. The evolution of the LSI at the class level is proof that the majority of elements in the landscape increased from 1973 to 2001. This indicates that all patches became increasingly disaggregated and fragmented as a result of desertification. The LSI of all patches decreased continuously from 2001 to 2007, indicating that the fragmented patches were being aggregated together

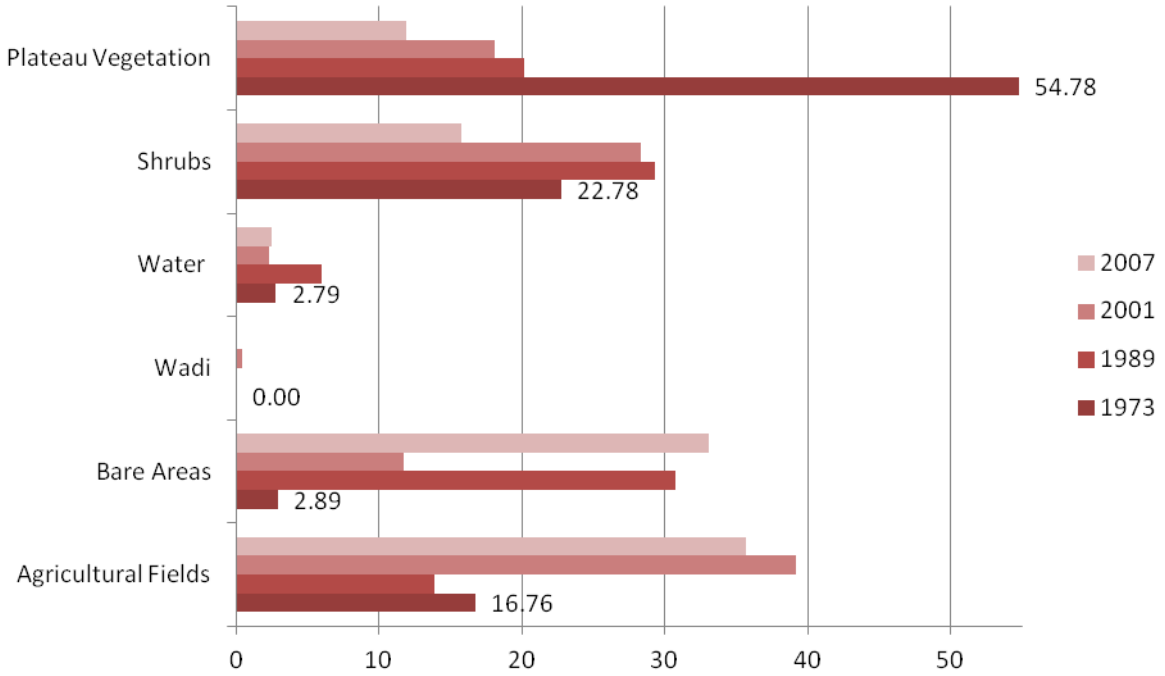

Figure 2. The percentage of land index at class level from 1973 to 2007.

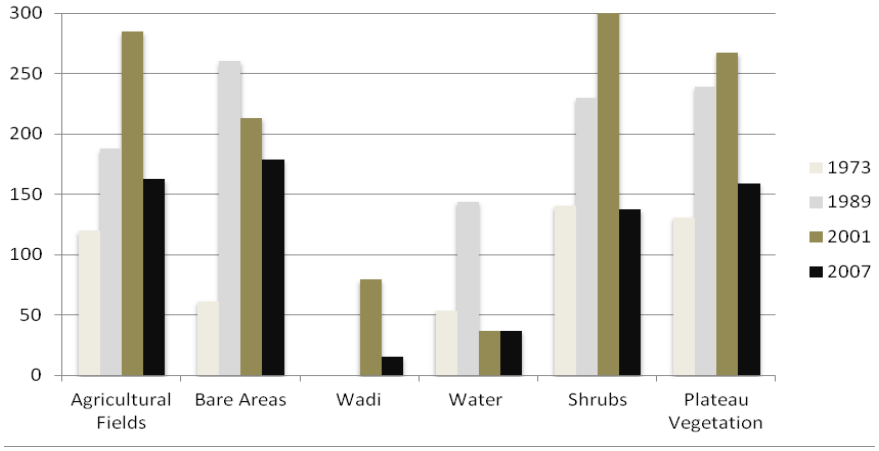

Figure 3a. Evolution of Landscape Shape Index (LSI) at the class level (1973-2007).

under a dominant land cover class (in this case, bare soil) on the landscape. The spatial distribution of LSI for the study area is presented in Figure 3a. The figure indicates that the higher the LSI, the more fragmented the landscape is.

Figure 3b shows the spatial distribution of the MPFD during the study period. The blue patches represent a departure from a Euclidian geometry (more complex in term of the shape). Patches with red represent a reduced shape complexity.

Interspersion and juxtaposition index (IJI)

The goal of this part is to investigate the degree of clumping of various land cover classes in the Tillabéry landscape. The degree of clumping deals with two spatial aspects (dispersion and interspersion). It is expressed in percentages and its value approaches zero when patch types are clumped (the distribution of unique patch adjacencies becomes uneven) and approaches 100 when all patch types are equally adjacent to all other patch

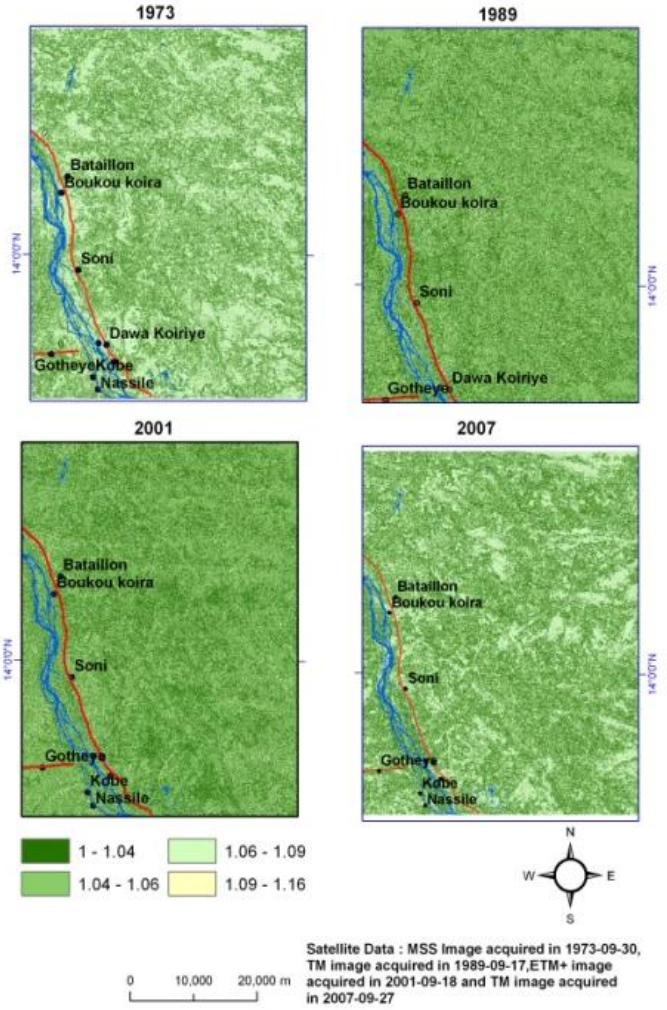

Figure 3b. Spatial distribution of Mean Patch Fractal Dimension Index.

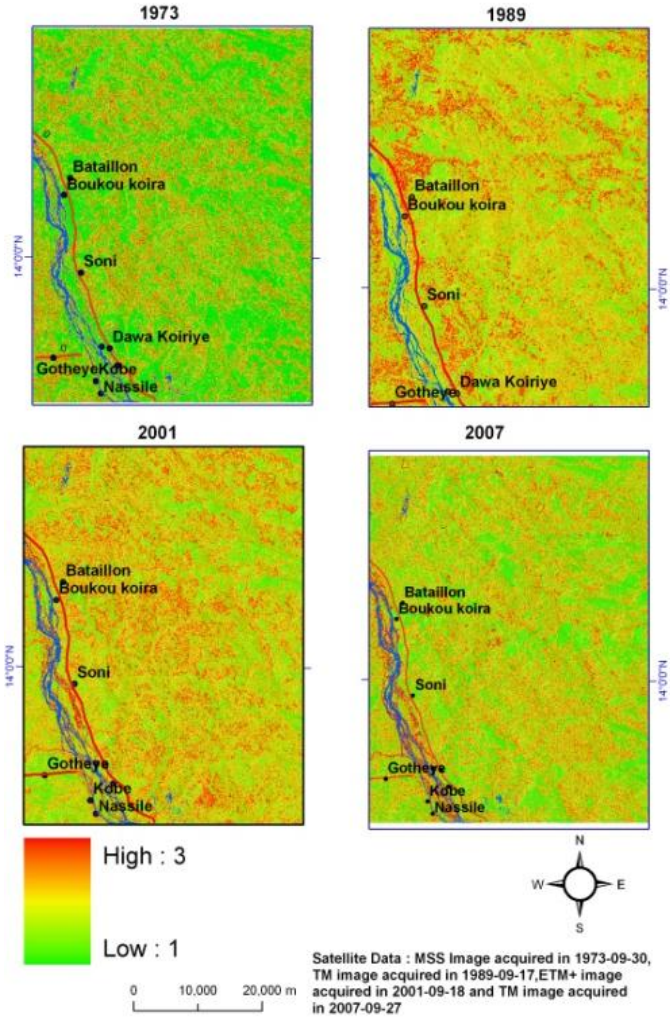

Figure 3c. Spatial distribution of Landscape Shape Index for study area.

types. The index is independent of the number, size or dispersion of landscape elements.

In the years 1973 – 2001, the IJI for all the landscape elements was high for all the classes compared to the period 2001 – 2007 when it decreased (Figure 4a). The spatial distributions of the changes in the IJI are further shown in Figure 4b. This is an indication that the different land cover types became poorly interspersed with time reflecting that they are dependent on water availability on the landscape. A focus on plateau vegetation show that the IJI is high in 2001 implying that the vegetation is adjacent to almost all other elements. This is a clear pointer to the fact that by 2001 the vegetation had been highly fragmented and large single patches were becoming a rare occurrence on the landscape, thereby depicting an increasing trend towards land degradation and desertification in the Tillabéry landscape. In 1989, a low value is observed with agricultural areas. This conforms to the findings of (Lal, 2001) that desertification has a negative impact on soil nutrient storage, which inadvertently leads to emission of carbon from the soil to the atmosphere.

Monitoring landscape fragmentation at landscape level (An environmental indicator)

Landscape fragmentation is considered as a key menace to biodiversity and fosters desertification in the study area. It decreases the area suitable for grasses (*Aristidastipoides, Schoenefeldiagracilis* and *Cenchrusbiflorus)*, and wood species such as *Acacia tortilis* (FAO 1986). Animal species such as *Gazelladama, Gazellaleptoceros* and *Lycaonpictus* have also become endangered (IUCN, 2004). It further manipulates interactions among species (Braschler, Lampel and Baur,

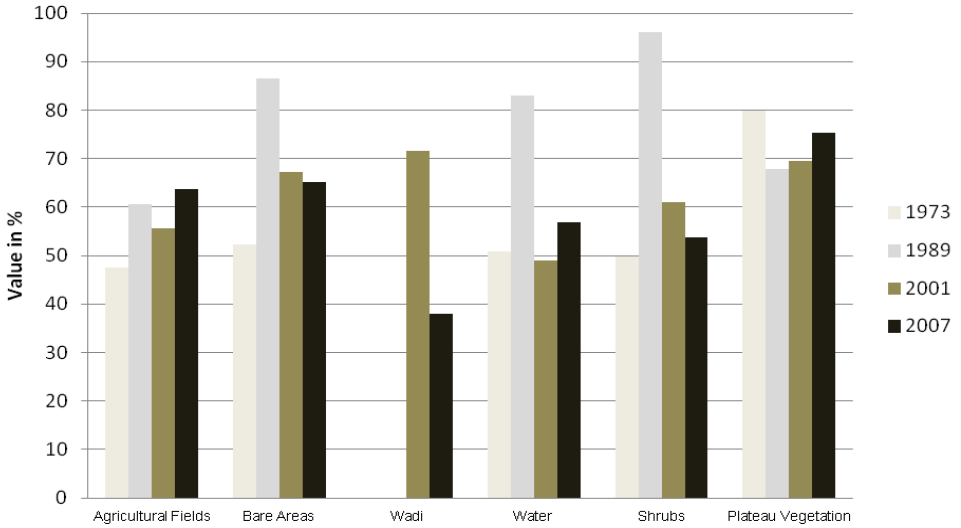

Figure 4a. Evolution of Interspersion and Juxtaposition (IJI) at the class level (1973-2007).

2003). The results of fragmentation analysis at landscape level are shown in Figure 5. It indicates that the patches are fairly stable but highly connected. From a visual interpretation of the degree of landscape fragmentation from the images for 1973, 1989, 2001 and 2007 it is clear that the landscape was comparatively stable in 1973 as it recorded a fragmentation rate of 0.9 as opposed to 2001 when the fragmentation rate increased to 2.15. As a more stable land cover class (bare soil) became more dominant on the landscape, the fragmentation rate further decreased to 1.20 in 2007.

From the images, it is also clear that the spatial distribution of the rate of fragmentation is randomly distributed and shows a dominance of bare areas over the other land cover classes. Areas that are severely fragmented also demonstrate low vegetation cover due to the absence of water breaks and a resulting high level of surface run-off and an associated high level of soil erosion (Wu et al. 2000). Areas that depicted low fragmentation values correspond to the land cover class called “resistance to deserts” such as river and vegetation.

The analysis evidently exposes the state of landscape fragmentation over time. In 1973 the study area shows a lower degree of fragmentation value, compared to 1989, 2001 and 2007. The spatial distribution of the degree of fragmentation indicates that the fragmented areas increased considerably between 1989 and 2001 especially around River Niger and at the centre of the study area (Figure 5a to d).

Conclusion

This study explored the applicability of a landscape metrics approach in analysing land degradation and desertification in the Tillabéry area (Niger). Prior to this study, most research topics in desertification have focused on the Medalus method, which focuses on climate, soils, vegetation, anthropogenic and geomorphological factors without any allusion to historical changes on the landscape as a parameter to capture and understand trends in land degradation and desertification. Applying a landscape metrics approach provided a useful technique for quantifying and qualifying the spatial location, the structural changes and at the same time illustrating the spatio-temporal dynamics of a landscape in an area prone to desertification. By combining previously applied methodology in investigating desertification and at the same time providing additional information for desertification studies in the form of a time series analysis, makes this approach novel.

The fundamental result of the study shows that desertification processes intensified between 2001-2007 and the landscape has been severely degraded. This makes it imperative for NGO's involved in landscape sustainability and the Niger government to step up efforts to combat desertification and land degradation processes in the Tillabéry landscape. As Sendzimir et al. (2011) and Larwanou and Saadou (2011) have demonstrated, prospects of achieving positive results are high especially when one takes into consideration the re-greening of the Tahoua and Maradi regions.

Conflict of Interests

The authors have not declared any conflict of interests.

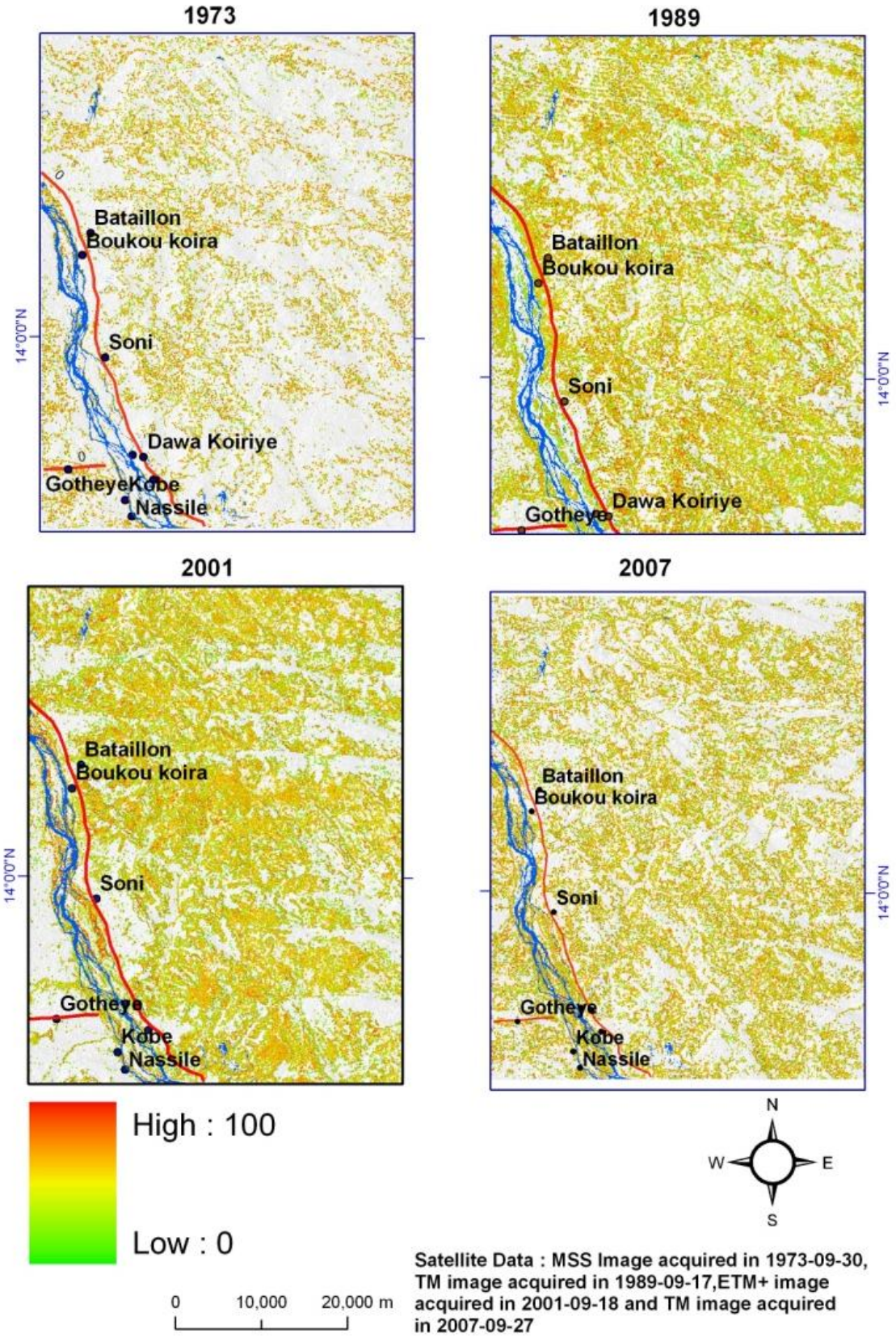

Figure 4b. Spatial distribution of Interspersion and Juxtaposition (IJI) at the landscape level (1973-2007).

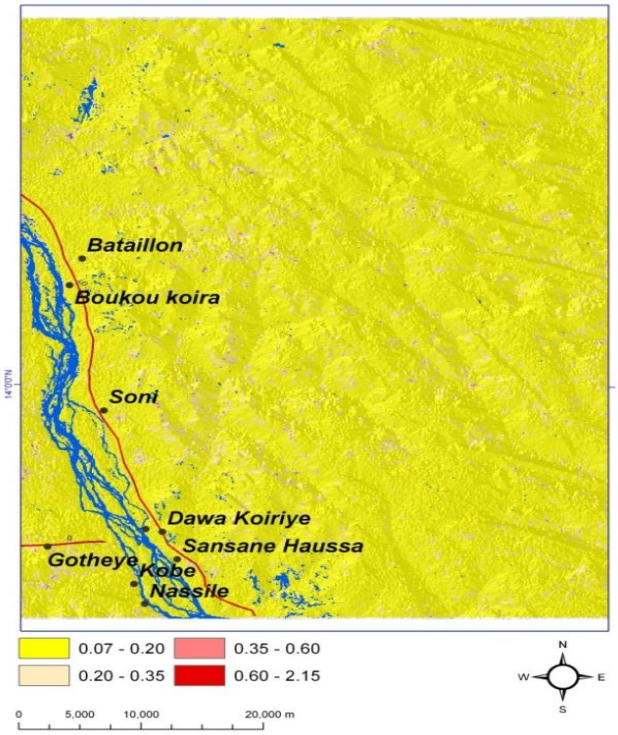

Figure 5a. Degree of landscape fragmentation rate from Landsat MSS image acquired in 1973-09-30.

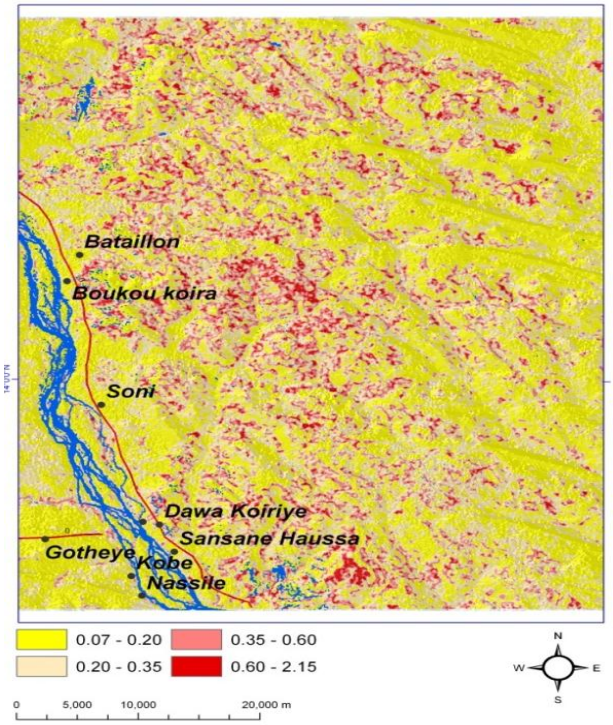

Figure 5c. Degree of landscape fragmentation rate from Landsat ETM +image acquired in 2001-09-18.

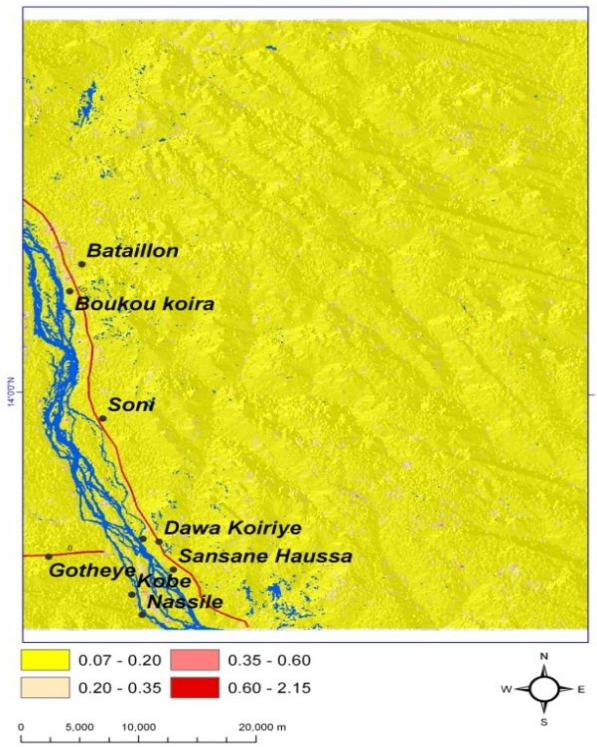

Figure 5b. Degree of landscape fragmentation rate from landsat TM image acquired in1989-09-17.

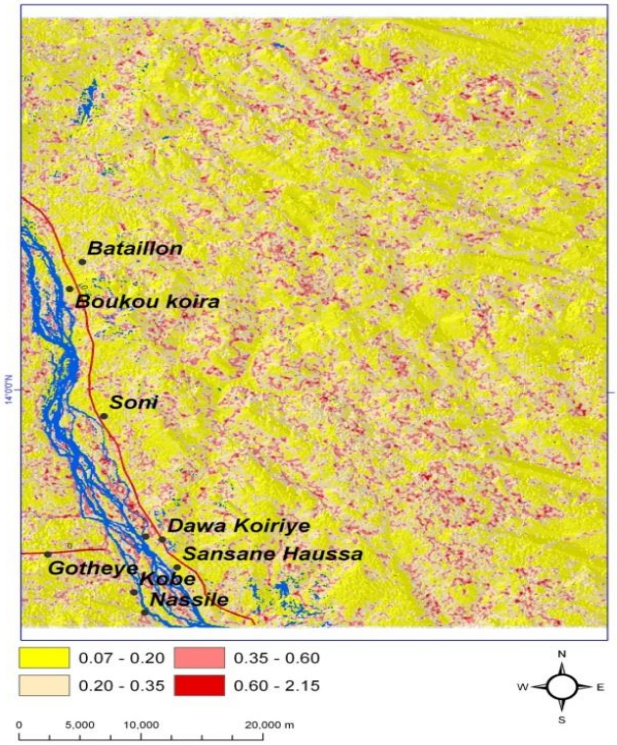

Figure 5d. Degree of landscape fragmentation rate from Landsat TM image acquired in 2007-09-27.

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Journal of Geography and Regional Planning

Full Length Research Paper

Evaluating indigenous environmental consciousness with residents of Ogbomoso in Nigeria

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The study assessed the level of indigenous environmental consciousness and education in Nigerian cities using Ogbomoso as a case study. It identified the level and limitations to the consciousness of environmental issues; it also evaluated the presence and level of indigenous environmental consciousness; examined the forms of indigenous environmental education prevailing in the city, how it is acquired, and their relevance to environmental management. It also assessed the effectiveness of this indigenous environmental consciousness and relayed the outcome of the survey for further work, by the incorporation of indigenous knowledge into the educational curriculum. The study elicits various indigenous educations relating to the environment, the level of awareness as regard such and the effectiveness. Data for this research were obtained mainly from a comprehensive questionnaire survey, which were administered to 3,000 (10%) households from the total of 30,020 households in the study area. The data collected were analysed using simple statistical techniques such as frequency table and percentages. Simple linear regression was used to explain the relationship between education, level of environmental consciousness of the people, income level and level of consciousness to environment. The study observed that the level of education is negatively related to the level of environmental consciousness and the level of income is directly related to environmental consciousness. The study shows that traditional and indigenous education are the avenue through which indigenous knowledge is passed to people through gradual socialization of youths in a society into its norms, religious beliefs and moral values.

Key words: Indigenous knowledge system, environmental consciousness, education.

INTRODUCTION

The problems of world environmental degradation and depletion have been focused upon especially in the past two and a half decades. The increasing global awareness of environmental problems after the 1972 Earth summit held 42 years ago in Stockholm. The event launched thousands of grassroots conservation groups around the world and spurred environmental agencies, media houses, educational institutions and ministries in more than 115 nations of the world into action (Risiro et al., 2013).

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Nigeria and other West African Countries have come to recognise that problems of environmental degradation are not restricted to the developed countries alone. Developing countries have had to battle with environmental problems like flooding, deforestation, soil erosion, refuse and sewage disposal, population congestion due to urbanisation etc. In this wise, the number of agencies dealing with environmental issues in developing countries has also increased. Egunjobi (1993) noted that the number of these agencies have increased from eleven (11) in 1972 at the Stockholm Conference to eighty seven (87) seven years later. In realisation of these problems, the United Nations organised another Earth summit in June 1992 in Rio de Janerio, titled 'Environmental and Development'. This also seeks to heighten awareness of the global ecological crisis that offers opportunity to persuade countries to look beyond national interest, and agree to some basic changes in the way they treat the environment. The growing awareness on environmental issues also gives the impetus to the government in Nigeria to solve the country's environ-mental problems. It seems apparent that the effort of the government is not yielding the desired results. This is due to the non-involvement of the people in the management of the environment, the seeming low level of awareness, and ineffective education of Nigerians about their environment (Agbola and Mabawonku, 1994).

This is further explained by Chokor (1988) that assessment of public awareness of environmental problems in Nigeria is at best incoherent and incomplete. Two schools of thought were discovered on the issue of public awareness of environmental problems in Nigeria. First, there are those who speculatively believe that the vast majority of people are unaware of the magnitude of environmental problems confronting them and that only the better educated and high income groups seem to be able to make a connection between the health of their family and environment in which they live (Onibokun, 1992). Secondly, there are those who through direct research survey, have come to some form of conclusion that ordinary people possesses a substantial knowledge of the complexities of environmental problems besetting them and indeed make efforts to articulate and adjust favourably to them (Chokor, 1988; Egunjobi, 1983). Whatever conclusions may be reached from those opposing views, one thing is certain and that is consciousness of environmental issues, especially pollution, which is low and least, understood in Nigeria. Several facts may be adduced to support this claim and provide underlying reasons for this low public consciousness. First, there is dearth of environment pressure groups in the country, only in riverine areas, adversely affected by oil pollution, resource depletion and the consequent onset of hunger, have community groups arisen to oppose excuses of private, public and multinational exploitation. A second major factor accounting for low public environmental consciousness stems from our national education system, which places a low priority on environmental education (Onibokun, 1993). Warren et al. (1996) based this on the fact that the earliest Nigeria educational system was introduced by the colonialists with the initial concern for the maintenance of law and order. The system was essentially meant to produce interpreters, teacher, pastors, clerks, administrators and policemen. Thus, one major weakness of the system, however is that it failed to appreciate the fact that there was an indigenous foundation upon which the Western type could have been built (Rusinga and Maposa, 2010).

There has therefore been a near total neglect of traditional system of learning, teaching, communication, research and experimentation. This situation has a negative effect on development in all ramifications and also on people's creativity, ingenuity, novelty, technology and skill. Furthermore, since knowledge that is indigenous can be traced to the grassroots, the people at the grassroots will have the opportunity for the first time to contribute significantly to the contents of the curriculum. This will create a sense of honour and participation at the planning stage, which will in turn promote a sense of belongings in the people, which is also a good one to further campaign for public participation and self-reliance. As a growing army of persons began recording indigenous knowledge systems in many parts of the globe, it became apparent that the country's indigenous knowledge was invariably over looked as a national resource that could facilitate development efforts and enrich educational curricula in a country (Warren et al., 1996).

Thus, it is against this background that this study surveys the indigenous environmental consciousness and education of the residents of Ogbomoso city in one of the Nigerians cities as of great importance.

THEORETICAL ISSUES

Efforts hitherto and concurrently put forth in combating the urban environmental yielded limited success or have in most cases ended in total failures. In this regards, it is contended that prescribed solutions which so far centred on more planning technology, restructuring the administrative frame work and enlarging the budget, have not produced the desired results, partly because the solutions have been based mainly on the values and understanding of the elite decision makers. They are prone to assume a monopoly of diagnosing the problems, prescribing and administering antidotes. The assumed monopoly is also taken, as given and therefore unchallenged by the general public. Thus, a gap does exist between decision makers on one hand, and those whose lives are supposed to be affected by the decision on the other (Egunjobi, 1993).

Gaye and Dialto (1997) are of the belief that within this bleak picture of inadequacy of public service to 70% of

urban dwellers in Africa and also a sense of powerlessness of not being able to address such problems, there are some elements of hope. Whereby, alternative approach is slowly emerging in answer to the urban challenge. This new approach sees protecting the environment as an integral part of development rather than an obstacle to economic progress, which stresses that local problems can be solved by local communities, by all groups in the community, including women and young people working and taking decisions together. There is nothing isolationist about this approach, bringing us back to public preference and participation. This is supported by Eyong (2007) who believes that increasing demand for public participation in planning has resulted from the failure of planners to intuitively recognise the preference of the public, for proper implementation of environmental development plans (Nakashima and Rou´e, 2002).

In the same vein, Brush and Stabinsky (1996) emphasised that public preference elicitation, however, would seem to be of greatest value for urban planning. It is difficult to argue against the view point that on ethical grounds, people have the right to be consulted about plans and decisions which not only may profoundly affect their way of life, but which they are also paying for through public funds. On the other hand, effective lay participation often requires some understanding of the concepts and methods by which production decisions can be made. Thus environmental awareness proposes to stimulate interaction between community participations from lay or professional positions. Thus, successful policy on environmental control therefore hinges on exigencies of politics and demands effective articulation of public opinion and supports; while the degree of support of the public for environmental problems should be enhanced. Hence, there is an urgent need for public consciousness education and participation in solving environmental problems in Nigerian cities (Chokor, 1988).

Agbola and Mabawonku (1994) are of the view that environmental awareness and education of the public can be best achieved through the incorporation of environmental concerns into our educational content and methodology as well as in mass media programmes. Educating the public through mass media is dependent upon the literacy of a population. Saveland (1974) proves the use of environmental education in Nigeria is likely to fail, as majority of Nigerians are not literate. Accordingly, the larger segment of the nation cannot readily become environmentally conscious through the formal and to a less extent the non-formal education systems. This is to say that, were formal environmental education incorporated into the school curriculum today, it would leave a substantial number of Nigeria out (Agbola and Mabawonku, 1994).

The study looked at the existing gap, regardless of the various developments on indigenous knowledge system (IKS), since its inception and observed that only few researches have been devoted to environmental education and sanitation globally, which is the main reason for this research into the city of Ogbomoso so as to evaluate the consciousness of the masses on indigenous knowledge and its applicability. Therefore, mentioned area of focus justifies the reason for incorporating indigenous consciousness and education into environmental programmes. This research was therefore tailored towards examining the level of indigenous environmental consciousness and education of Ogbomoso people, hitherto and presently verifies its usefulness in communicating environmental programmes to the masses in future.

LITERATURE REVIEW

Two interrelated concepts have been chosen as the anchor for this study. These are the citizen participation concept and the indigenous knowledge concept.

Citizens participation: The present passion for citizen involvement at various stages of the planning process has US (United State) origin and in an attempt to improve their capability in strategies of citizen participation, many British Planners have avidly turned to US pronouncements and case studies. This research into American planning literature has brought to the attention of British practitioners the work of Arnstein (1969), and according to Fagence (1973), public participation as an integral part of planning that has been adopted in England and wales since 1968. The concept of citizen participation has become a widely accepted principle, and the definitions vary as much as there are scholars. Participation can be viewed as consultation with decision makers and a two way information flow. The new theory of democratic government has been stated as being one, which defines participation as the central right of all citizens. This means the involvement of individual in the design and policy processes of organization to which they belong as well other policy processes, which affect his or her future regardless of formal memberships (Fagence, 1973).

Nakashima and Rou´e (2002) are of the view that citizen's participation means more than consultation; it necessarily involves a transfer of power from professionals who have technical skills deemed appropriate for dealing with problems and from politicians whose function is to determine the use of which these skills are put in public interest. Eyong (2003) defines participation as the process by which individuals' households understand their situation better, and are motivated to solve their own problems. In doing this, they become agents of their own development and not passive recipients. Lanconte (1976) believes strongly that constructive citizen participation is a systematic process which provides an opportunity for citizens, planners, elected representatives and members of relevant agencies to share their experience, knowledge

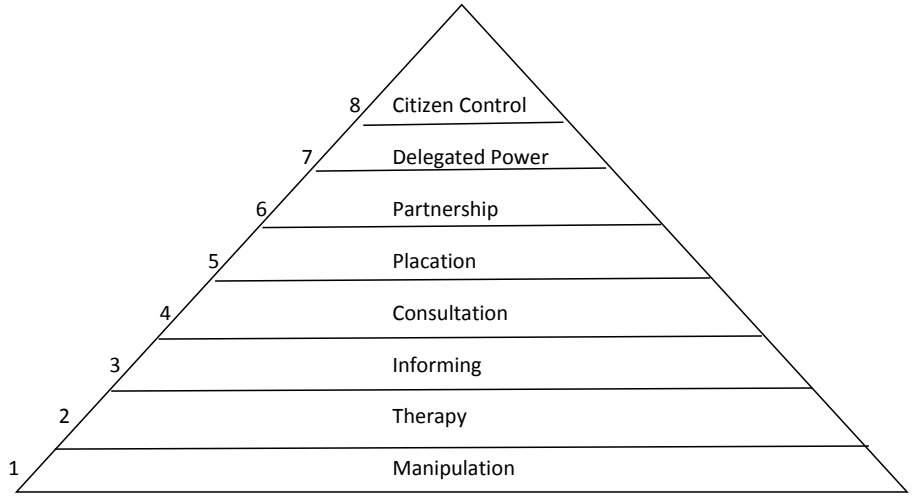

Figure 1. Ladder of citizen's participation. Source: Arnstein (1969).

and goals and to combine their energy plan in order to participate in the socio-cultural environment. This plan can then reflect their knowledge and best judgement at the time and will be understood and actively supported by most of those affected by it.

Conceptually, judging from Lanconte's definition and his works constructive citizen's participation is not: selling predetermined solution by public relations techniques; planning behind closed doors when information can be shared; one way communication e.g. planners telling people what is best for them; public confrontation between "people power" and the bureaucracy; by passing elected representatives or impairing their freedom to exercise their decision making responsibilities. but constructive citizens participation is: decision makers listen to residents; citizens find early and convenient opportunities to make positive contributions; citizens learn from planners and others, a broader and deeper knowledge and understanding of their environment;

individuals, interested groups and agencies are identifying with each other; the organizational activity and analysis will be collegial, non – hierarchical, face to face problem solving group that is large enough to include perspective and expertise necessary with the problem at hand, but small enough to assure each participant that his / her contribution is substantially meaningful and is indispensable to the process. This is further proven by a British practitioner, Arnstein (1969), who categorically summarized various terms thought to be participation, which are not. This is shown in his ladder for citizen participation (Figure 1).

The ladder shows various ways of involving citizens. But according to Arnstein (1969), participation must be above all these processes; though each level has precedence over the previous process. The concept of citizen participation has come to be an important principle in planning. The spirit is that it ensures success in planning projects. More so, it cuts across other areas other than planning. Thus participation has reaching advantages; these include: political advantage that it is democratic in nature. People listen to you and you listen to them as a leader and know their cultural background before decision could be taken together. Secondly, economic value which was based on resource pools and resource sharing which will make the planner not to be the only one to be responsible for projects, but the community at large; and also, there are social values which show citizen participation that gives participants a sense of ownership. Other values are the psychological one and a sense of identification (Arnstein, 1969).

Hence, there is an urgent need for public consciousness, education and participation in solving environmental problems. But, creating awareness in the public is dependent upon the literacy of a population. Saveland (1974) proves that the use of environmental education in Nigeria is likely to fail as a larger percent of the populace are far from being literate. Significantly, formal environmental education incorporated into the school curriculum today leave a substantial number of Nigerians out (Agbola and Mabawonku, 1994). Thus, the aforementioned areas of focus justify the reason for the suggested incorporation of the indigenous knowledge concept into the next stage of the global environmental management strategy especially in the third world countries.

The second concept used for this research is indigenous knowledge system /concept (IKS).

The Concept of Indigenous Knowledge System (IKS)

The term indigenous knowledge system is also referred to as: Indigenous Technical Knowledge (ITK) by Kolawole (2001), Local Knowledge by Brush and Stabinsky (1996);

Traditional Knowledge by Horsthemke (2004) and also referred to as Community Environmental Knowledge and Folk Science by Kallard (2000). Furthermore Eyong (2007) described it as Village Science while Khan et al. (2008) described it as Ethno Botanical Knowledge System.

Warren et al. (1996) defined IKS as the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture. IKS rests on a validated assumption that an indigenous community is guided by those principles and practices which they have developed from many years of experiences and from generation to generation often based on the oral tradition (ISDR, 2008). It could also be defined as 'Local knowledge that is unique to a given culture or society. It is the information base for a society, which facilitates communication and decision making (Warren et al., 1996).

The characteristic features of IKS as given by ISDR (2008) are that IKS is unique to a group of people; serve as a spring board to technological development; dynamic rather than static, oral (not formerly documented); experiential; and highly accessible. Other characteristics of IKS as noted by Horsthemke (2004); Thrupp (1989) and Khan et al. (2008) are that: IKS is not only possessed and practiced by men, but also by women; IKS is of great relevance to all cultures especially in the developing world and the traditional societies; enhances the social psychological value of a people; it promotes meaningful communication between extension agents and their clientele; also, is particularly relevant as a springboard to technological development and improvement especially in the less developed societies and is also increasingly regarded as an 'intangible resource' which is highly vulnerable to commercial exploitation (Warren, 1995).

Indigenous Knowledge System (IKS): The unfortunate relegation of our known practices constitutes the IK system and the need to integrate IK system into the school system. Indigenous knowledge system (IKS), though a relatively discipline, is an important areas of human endeavour which has been part of traditional society from time past (Maila and Loubser, 2003). Warren et al. (1996) defined IK as the systematic body of knowledge acquired by local people through the accumulation of experiences, informal experiments and intimate understanding of the environment in a given culture. IKS rests on a validated assumption that an indigenous community is guided by those principles and practises which they have developed from many years of experience and from generation to generation often based on oral tradition (Chatty and Colchester, 2002). IKS could be defined also as 'local Knowledge' that is unique to a given culture or society. It is the information base of a society, which facilitates communication and decision making (ISDR, 2008).

Relevance of IKS: It promotes the full and active participation of local people in their own affairs in all ramifications as science itself. IK is capable of being integrated into modern science; it is resource conserving, environmentally; it is a tested and accepted local knowledge and easily adaptable; it can help people learn how to live in harmony with nature and the entire human settlement; it can reduce dependence on foreign and often time inappropriate solutions to local problems; also it promotes greater participation of local people in the prioritization of their needs and decision making. IK promotes greater understanding of various forces shaping the built environment, the consequences of human activities, and the indigenous methods or approaches to achieve sustainable development (Wahab, 1984).

Application to Nigeria: A growing awareness of the values of IKS national development became evident in Nigeria in 1993 through the Nigeria University Development Linkage Project (UDLP). IK has potential value for sustainable development, and it can help people learn how to live in harmony with nature and the environment. Although, IK has been recognized as a necessary spring board for technological improvement in a society, this has thus far been neglected in Nigeria's education system (Warren et al., 1996).

The Environment: The environment is emerging as one of the major issues confronting planners and the nation during the current decade and by the turn of the century the crescendo will build up, spilling over to the beginning of the 3rd Millennium. To further expatiate on this, it will be expedient to define the term environment. The environment is the physical environment which encompasses land, water and air, nature and its habitat, the ecosystem and all the factors and facets which constitute the living environment. It is both man-made and natural. It is an environment that is subject to stress and is vulnerable to different types of pressures with adverse results such as degradation, pollution, erosion, over flooding and desertification. It is also an environment that responds to improvements thereby resulting in beautiful and surroundings assuring for the citizen a better quality of life (Agbola and Mabawonku, 1994)

Environmental Problems: Duri and Mapara (2007) assessed the relationship between economic growth, technological advancement and environment problems in the developed countries. He noted that while a number of people are benefiting from various countries, economic growth and technological advancement, the society as a whole has continued to suffer from increasing pollution and environmental problems resulting from intensive industrialization and breakdown of ecological balance. Carew (1991) specifically gave illustration of countries, development and corresponding degradation of the

environment. The United States of America for example has 5% of the world population, as 25% of the world's energy, emits 22% of carbon dioxide, produce and account for 25% of the world gross national product. Adedibu and Okekunle (1983) further gave insights into the attitude of developed countries towards environmental degradation and they observed that the developed countries are soliciting for the world to tolerate the environment, while they enjoy shooting up income and employment. All these are on the global scenes.

The African part of the environmental problem cited by Gaye and Dailto (1997) was on the acute problems of inadequate provision of waters, sanitation, drainage and disposal of garbage all over the continent regardless of the fact that the urban population is growing at a rate of over 5% a year. In another development, Adedibu and Okekunle (1983) presented the environmental problems resulting from the present growth rate. They noticed, that of a particular significance is the observation that the rate of housing construction falls short of the rate of urban growth, which implies increased densities that actually lead to overcrowding.

Egunjobi (1993) dealt specially on the functional, aesthetic and sanitary deficiencies of the buildup environment in Nigeria. This he attributed to the sanitary condition in and around the houses that are already overcrowded. The mixed attitude of the third and advanced world cities was cited by Onibokun (1993); where the advanced countries seeing the critical financial situation and growing environmental problems besetting many cities as moving towards 'inexorably towards disaster' or even death. But many people of the third world cities see cause for hope rather than despondency. These and many others have led to the various environmental strategies.

Environmental Management: The ardent need for urban management, as noted is often argued that urban problems in Nigeria have reached such alarming proportion because of the lack of effective urban management. Furthermore, it is argued that urban government is ineffective because they are poor and management and technical personnel are in short supply which complicates the issue. The general usage of the term environment management system shows that it refers to the various mechanisms put in place to prevent, minimize, rectify, reduce or eliminate on a continuous basis, the impacts of environmental deterioration. In this case such things as impact assessment, mitigation and compensation are some of its component activities and programmes (Onibokun and Faniran, 1995).

Waste Management: The heavy problems created by solid waste generated has more or less outweighed the technology available to cope with the disposal in most developing countries; thus resulting in other environmental problems like; flooding and epidemics. Wrong solutions are accorded to urban solid waste problems, in which all efforts to solve the problems of waste crisis in Nigeria have failed, as the efforts were directed towards instant cleaning rather than programmes to cope with problems associated with environmental sanitation (Adedibu,1984). On this note, Ebert and Niser (1986) gave guidelines for solving the problems caused by environmental pollution in general, that is, there is a need to create awareness of individuals, communities and government about the problem of environmental pollution. The Federal government needs to promulgate an environmental protection decree, the state also needs to enact related edicts. Federal and State Legislation should be backed by mutually consistent action programs on local governmental pollution problems. Lastly, there is need for continuous research to enlighten individuals, countries, and government about the nature of environmental pollution problems and about the best ways of coping with it. But all these were not effectively carried out leading to campaign on sustainable approach to management.

Sustainable Development: The term sustainable development is concerned with the environment, development, and conservation and planning. It refers to specific developments which are related to environmental terms and which are sustainable. The definition according to the governing council of the United Nations Environmental Programme (UNEP) in 2008 is the development that meets the needs of the present without compromising the ability of the future generation to meet their own needs. Therefore, ecologically sustainable industrial development will be the out fall of a well-managed and regulated industrial process that contributes to economic and social benefits for the present without impairing basic ecological processes. Meaning that over time, economic development will hinge on efficient utilization of non-renewable resources conserving reasonable resources and not exceeding the waste assimilative capacities for our ecosystems (Agbola and Mabawonku, 1994). Despite the promising note surrounding sustainable development, it is quite obvious that the general masses cannot comprehend the complexities, it carries along with it. Most especially in developing countries, it is quite hard to differentiate between the national economic growth and development, nonetheless, relate it to distinct industrial revolution. There might be much to sustain, most of the strategies are still been argue as far as developing countries are concerned. Towing from this fact, government and environmental agencies sought a better embracing approach (Eyong and Mufuaya, 2004).

Healthy City Approach to Management: The next move in planning generally was that of the social approach to urban health. The point being further emphasized here is that although health for all, which implies equity, requires coordinate action of all sectors concerned; nevertheless,

a greatest responsibility falls on the people themselves to improve their well-being. This should be done by changing their individual altitudes, beliefs and habits which are injurious to health. This of course calls for effective enlightenment programme aimed at educating the public about their individual responsibility to health (Aregbeyen, 1993).

Environmental Consciousness and Awareness: Chokor (1988) proves that awareness has been evaluated to be low. He ascertained that consciousness of environmental issues is low, based on facts such as dearth of environmental pressure groups in the country and only in riverine areas adversely affected by oil pollution, resource depletion and the consequent on set of hunger have community groups arisen to oppose excesses of private, public and multinational exploitation. It is our national education system, which places low priority on environmental education beyond scholars of physical low priority on environmental education. Beyond scholars of physical / biological sciences in higher institutions, few people have access to technical information on environmental problems Furthermore, Chokor (1988) also reflected on the clear alienation of people through public policies, and the poor rate of public response to environmental issues. When he noted, that rather than be stimulated to have a say in environmental matter, people are rather conscious of being found wanting, fined or prosecuted under the circumstance, the environment and public feeling over its control becomes an issue of terror and fright for the people. Environmental consciousness is important and the media must be tasked, this is because media have the capacity to inform, to educate, to arouse and to create awareness and when imaginatively used, they do serve as effective channels of communication (Duri and Mapara, 2007).

Environmental Education: To unravel the blame apportioned to environmental education as the root cause of low environmental awareness, a review was done with the following findings. Onibokun (1993) related the history of environmental education in Nigeria, in which she stated that although environmental problems have been part of us since time immemorial the need for environmental education in Nigeria started in 1988 when the Nigeria Conservation Foundation prepared national strategy on conservation education aimed at arousing interest of people in environmental education. According to Adedibu and Okekunle (1983), environmental education can be defined as teaching from the environmental, about the environment and for the environment. The objectives and principles guiding environmental education, according to Carew (1991), is to educate the younger generations as well as adults about environmental matters, so that they could learn how to protect and improve their environment. Onibokun (1993) further stressed that if the objectives of environmental education are met, the following should result, which are: people awareness, which is the acquiring a consciousness and sensitivity to the environment; also citizen knowledge that involve acquiring basic understanding of the environment.

Furthermore, the issues of people attitude which involved acquire social values, strong feelings on concern for the environment in motivation for participating in its protection. Others are citizen skills, which involved acquired skills for solving environmental problems and evaluation ability of the people that involved ability to be able to evaluate environmental measures and education programmes in terms of ecological, political, economic, social aesthetic and educational factors. Also community participation which helps individuals and social groups develop a sense of responsibility and urgency regarding environmental problems (Onibokun, 1993).

Environmental education is frequently both inadequate and inefficient, as little attention is paid to the outside influences of its cultural, scientific and political context. It will be inadequate that ecological politics, research and education concentrate almost exclusively on manifestation of environmental damage, with little attention to human behavior as the main cause. Intellectual activities neither really accepts responsibilities for social development nor work towards improvement of the psychological and behavioural evolution of man (Schleicher, 1986). From Western Europe and Federal Germany, great attention has been paid to politics and public opinion to environmental damage since 1970s the main focus however, is more on symptoms than on human behaviour and behavioural changes which are the causes. And although, great doubt exists as to whether politics is really able to cope with ecological challenges, environmental protection is expected more from administrative measures than from education (Schleicher, 1986).

The argument, on educating citizens on environmental issues, is that formal education system can play an important role in Africa, but such a system to meet the cultural, social, moral and intellectual, as well as political and economic needs of African, needs to be domesticated and indigenized. And it is here that indigenous forms of education becomes crucially important. The philosophy, methodology and content of schooling in African need to be shaped and reframed, not exclusively but to a far greater extent, by indigenous perspectives. This means those that operated before the arrival of the western and Islamic education systems need to be look into and the consideration, views, opinions, assessments of past. The contemporary African educationists who through researches and experiences have become aware of the needs and goals of African Societies and that no serious educational planning can be undertaken without identification of the specific needs and goals of particular African societies (Adedibu and Okekunle, 1983).

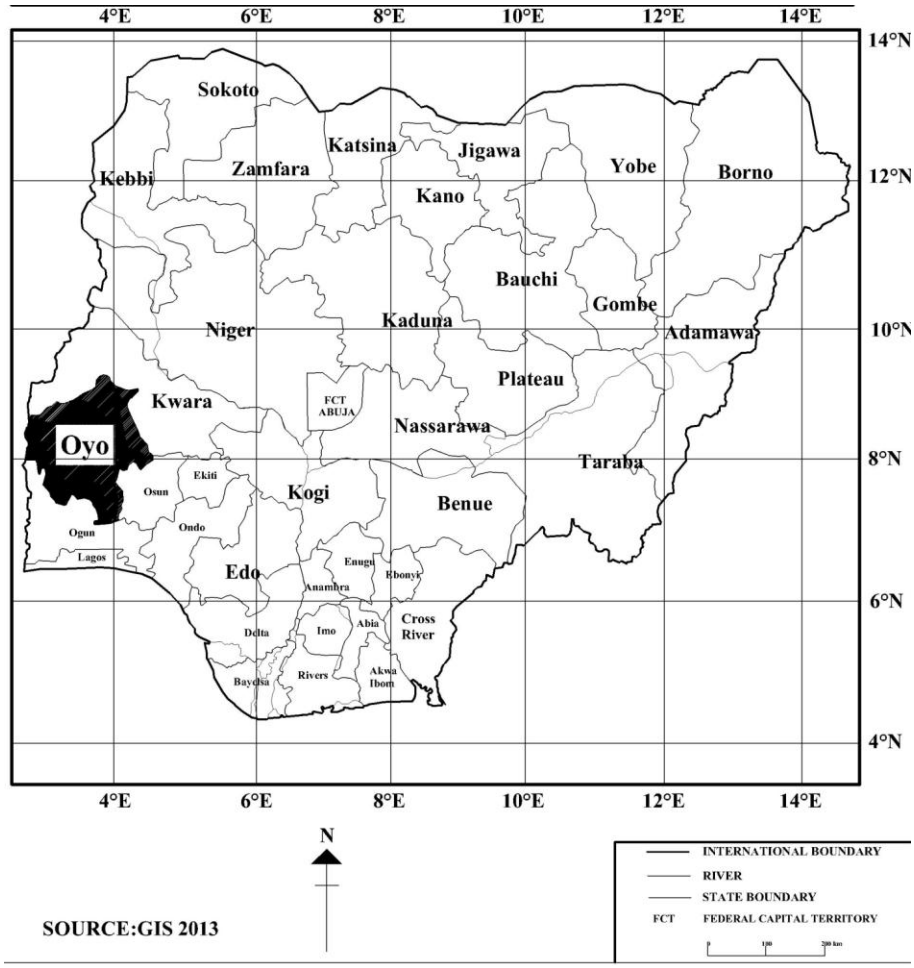

Figure 2. Map of Nigeria Showing Oyo State.

THE STUDY AREA

Ogbomoso lies at approximately 8^0 07' North of the equator 4^0 15' East of the Greenwich meridian. It is one of the most important cities of Oyo State and in fact Nigeria. The town now lie within the derived savannah region and is approximately midway, forming the gateway to the northern part of Nigeria from the South. Ogbomoso is 57 kilometre South West of Ilorin (capital of Kwara State), 53 kilometres North East of Oyo, 58 kilometres North West of Osogbo (capital of Osun State) and 107 kilometres North East of Ibadan (capital of Oyo State). Ogbomoso is situated on an important road link between the Northern and Southern parts of Nigeria. The Lagos – Ibadan – Ilorin North Bound trunk A road passes through Ogbomoso, so also is the proposed Ibadan – Ilorin express way still at designed stage.

The population of Ogbomoso, according to 2007 National Population Census, is 166,034. Male members accounted for 80,356 while female accounted for 85,678. Compactly developed residential zones characterize the existing land use in Ogbomoso. The land use distribution is typical of any urban settlements where a large proportion of the developed land is devoted to residential use and only a small proportion is used for commercial, industrial and other uses (Figures 2 and 3).

MATERIAL AND METHODS

Data for this research were obtained mainly from a comprehensive questionnaire survey. This was supplemented with survey of the existing formal environmental curriculum and intensive literature review. For the questionnaire survey, the local government political authority ward units of Ogbomoso were used. According to the local Government Authority, Ogbomoso is made up of twenty (20) wards. Altogether, each of Ogbomoso North Local Government and South Local Government were having ten (10) wards each. Since it is impossible to achieve a total coverage of the household within Ogbomoso, 10% representing 150 household in each of the wards were selected randomly and a total of 3,000 households were administered with questionnaires from the twenty (20) wards in the city. Subsequently, the questionnaires were administered to 3,000 (10%), of households from the total of 30,020 households in the study area. This infers that a total of 3000 households were sampled in the 20 wards. In each of the housing unit the household heads were be questioned. The data collected was analysed using

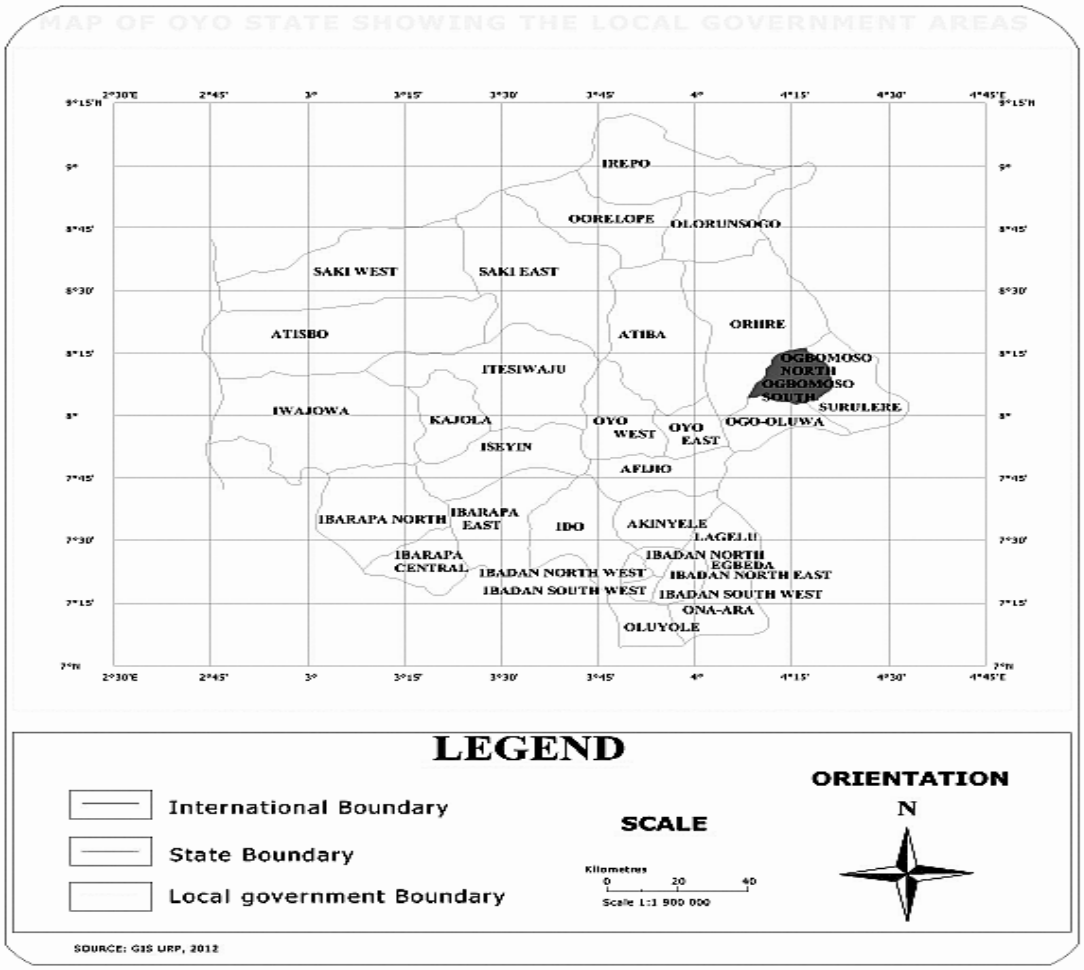

Figure 3. Map of Oyo State showing Ogbomoso.

simple statistical techniques such as frequency table and percentages. Simple linear regression was used to explain the relationship between education, level of environmental consciousness of the people, income level and level of consciousness to environment. This helped to determine whether education level and income levels of people determined their disposition towards the environment.

DATA ANALYSIS AND DISCUSSION

The analysis of the result obtained from the questionnaire on the perception and level of environmental education and awareness of Ogbomoso residents were based on the 3000 questionnaires administered within Ogbomoso.

Analysis of socio-economic characteristics of respondents

The analysis in this section includes sex composition, age composition, marital status of respondents, their educational level, occupation and monthly income level.

In the 37 localities chosen, the males constitute the larger percentage of the respondents with 66 percent while the remaining 34 per cent were females as shown in Table 1. The highest proportions of respondents were between the ages of 20 – 30 (64%). Revealing that a high percentage of the residents are youths that really need to be mobilized and serve a human resource for environmental management campaign; towing too from the fact that the city is the seat of a tertiary institution. The next group, which forms the second largest per cent of those interviewed, is those within the age of 31 – 40 forming 22 per cent. The other group is those within 41 – 50 (8.3%) and those over 51 being 5.7%. The respondents in these age groups are less than those that really exist in the town. But due to the fact that most of the aged were really old and cannot in most cases go through the rigors of being interviewed; but a high percentage of the old ones are quite enlightened and exposed since Ogbomoso people travel a lot to places like Ghana, Northern States etc.

Table 1. Socio-economic characteristic.

Sex composition	**Frequency**	**Percentage**
Male	1980	66%
Female	1020	34%
Total	3000	100%
Age Composition	**Frequency**	**Percentage**
21 – 30	1920	64%
31 – 40	660	22%
41 -50	250	8.30%
51 – Above	170	5.70%
Total	3000	100%
Marital Status	**Frequency**	**Percentage**
Single	1860	62%
Married	1090	37.30%
Widowed	50	0.60%
Total	3000	99.90%
Educational Level	**Frequency**	**Percentage**
Normal formal education	120	4%
Primary education	120	4%
Secondary education	520	17.30%
Polytechnic / University education	2000	66.70%
Postgraduate education	240	8%
Total	3000	100.00%
Occupation	**Frequency**	**Percentage**
Student/apprentice	1380	46%
Public service	410	14%
Private employee	610	20%
Self-employee	540	18%
Unemployed	0	0%
Retiree	60	2%
Total	3000	100%
Income Level	**Frequency**	**Percentage**
Below N18,000	910	30.30%
N18,000 – N50,000	800	26.70%
N51,000 – N150,000	340	11.30%
N151,000 – N300,000	500	16.70%
Above N300,000	450	15.00%
Total	3000	100%
Indigenous Composition	**Frequency**	**Percentage**
Indigenes	1880	62.70%
Non – indigenes	1220	37.30%
Total	3000	100.00%
Residential Duration	**Frequency**	**Percentage**
5-Jan	1020	34.00%
6 – 10	470	15.70%
11 – 15	420	14.00%
16 – 20	510	17.00%
21 – 30	150	5.00%
Above 30	430	14.30%
Total	3000	100.00%

The singles carry the highest proportion of 62%, the married carrying about 37.3% and the widowed and separated carrying 0.6% of the respondents, as shown in Table 1. This implies that greater percentages are still parenting and can pass on informed form of environmental education to the children. While the largest percentage of youths can still be influenced by the incorporation of informal environmental education into the curriculum or rather by being exposed to these informed environmental educations which they can carry on and use to influence greater grass root participation. As can be seen in Table 1, those who have attained Polytechnic / University education training level had the highest proportion of 66.70%. These are followed by those with secondary school certificate being 17.3%, the secondary degree holders are 8.0%, while primary school certificate holders amount to 4%, while those with no formal education were above 4%; this indicates that 96% were partially educated.

From the survey, students / apprentice carried about 46.0%, followed by the private employed; having 20 %, while the self-employed had 18%. The public service followed with 14%; the retirees were just 20% with no one claiming to be employed. Respondents with monthly income less than ₦18, 000 formed 30.3% followed by those income falls between ₦ 18,000 – ₦ 50,000, then those with ₦ 51, 000 – ₦ 150, 000 followed by those above ₦ 300, 000. Those within ₦ 151, 000 – ₦ 300, 000 were the least with 11.3%.

According to the survey 62.7% claim to be indigenes while 37.3% are not indigenes, but from similar indigenous neighbouring towns of Ibadan, Oke-Ogun, and Ilorin etc. A total of those who have stayed in Ogbomoso for 15 years above are just 26.3%. Having those who have lived 16 – 20 years to be 7.0%, while 21 – 30 years, had 15%, above 30 years to be 14.3%, while majority have only spent 1 – 5 years in Ogbomoso, as they amount to 34.0%. Those who have just lived 5 years are actually more than those that should have enough indigenous knowledge. This shows that mainly urban travellers, who either come for business and other transaction, dominate Ogbomoso and thus devoid of local traditional knowledge. Though those with good knowledge indigenously are significant, they could be soon extinct, if many of this knowledge are not transferred.

Analysis of perceptions of respondents on environmental issues

In the survey conducted as shown in Table 2, 71.6% were able to perceive the presence of environmental problems, but half of this percentage further explanation has been made for them to understand what is meant by environmental problems, 19% could not perceive such environment problems. Those respondents that agreed that there were no environmental problems were also

Table 2. Perceptions of respondents on environmental issues.

Environmental problems	**Frequency**	**Percentage**
Poor waste disposal	92	30.7
Bad drainage system	64	21.3
Water shortage	36	12
Pit latrines	29	9.7
Smelling abattoir	28	9.3
Erosion	20	6.7
Lack of toilets	19	6.3
Over crowding	5	1.7
Sewage disposal	3	1
Poultry dumping	2	0,7
Water pollution	1	0.3
Noise pollution	1	0,3
Perceptions of Environmental Problems by Respondents	**Frequency**	**Percentage**
Yes	215	71.60%
No	57	19.00%
Not some	28	9.30%
Total	300	99.90%
Perception of Offensive odour around Homes	**Frequency**	**Percentage**
Yes	185	61.70%
No	115	38.30%
Total	300	100%
Major causes of Offensive odour as perceived by Respondents	**Frequency**	**Percentage**
Polluted streams	20	10.80%
Domestic refuse	51	27.60%
Abattoirs	12	6.50%
Poultry	6	3.20%
Pit latrines	60	32.40%
Traffic fumes	18	9.70%
Unkempt drainage	18	9.70%
Total	185	99.90%
Medium of Information on Environmental Problems	**Frequency**	**Percentage**
Newspaper	5	1.70%
Television	37	12.30%
Radio	46	15.30%
School	62	20.70%
Personal contact	133	44.30%
Church/ Mosque	17	5.60%
Total	300	99.90%
Major Areas of Environmental Pollution	**Frequency**	**Ranks**
Sabo	120	1
Laka	52	2
Atenda	45	3
Oja Igbo	25	4
IsaleOra	40	5
Oragada	22	6
Kara (Vetenary)	16	7
Taki	10	8
Masifa	10	8
Stadium	9	9

Table 2. Cont'd

Adult Influence on Respondents Environmental Awareness	Frequency	Percentage
Father	77	25.70%
Mother	163	54.30%
Elder sister	0	0%
Elder brother	0	0%
Grandfather/mother	5	1.70%
Television	31	10.30%
Radio	12	4.00%
Government	12	4.00%
Total	300	100.00%

quick to identify or list several problems in the areas as shown in Table 2. This ranged from poor waste disposal or refuse disposal which was about 30.7%, followed by bad drainage system having 21.3%; water shortage problem was next in line having about 12%, pit latrine problem, 9.7%, smelling abattoir 9.3%, erosion 6.7%, lack of toilet consisting 6.3%, with traffic fumes, overcrowding, noise pollution, poultry dumping, water pollution are taking very minute percentage which shows that people do not seem to regard air pollution, noise pollution and flooding as major hazards. It also indicates the limit to people's awareness of environmental problems. But it shows that refuse disposal and drainage problems are predominant and were the main problems the people identify as treats in Ogbomoso environment. Greater hazards of pollutants in air are unknown to majority. As shown in Table 2, as regards offensive odours, 61.7% perceived it to be in existence while 38.3% agreed to its non-existence. The main causes being attributed mainly to smell from pit latrines (32%) followed by smell from domestic refuse (27.6%) and polluted stream and rivers. While traffic fumes and unkempt drainage took 9.7% each; Abattoirs ranked last with 6.5% with addition of sawdust burning fumes as others.

Table 2 shows the medium of information on environmental problems**.** On being asked, of the medium through which they got know about the environmental problems, the major response got was through personal contact (44.3%). This could imply that people are aware but not necessarily educated; as there is not much personal contact can do in giving one accurate gold mine information as being the cause of environmental problems by mere seeing. People still need to be taught and educated, not left to their own judgement alone which is not enough.

When asked of problematic areas in Ogbomoso as regard environmental pollution, the places mentioned are high density areas inhabited mainly by low income earners. There is further proven by the fact that 90% of the areas are commercial centres. Places where business transaction, marketing process takes place. The main problems sited were bad refuse disposal, none kept drainage, oil spillage, and lack of toilet and overcrowding. It is quite clear that the people here lack much consciousness and care of environmental cleanliness and management. Though they are aware of these problems, they are not seeking earnestly for ways of solving them. In essence the low income earners living there are not aware of the dangers and ways of alleviating the problems. Thus, the core areas, mainly inhabited by low income earners which form major per cent of the town are filled with environmentally uneducated people. The places mentioned in order of frequency are Sabo,.Laka, Atenda, Oja Igbo, Isale Ora, Oragada, Kara, Taki, Masifa and Stadium. It is obvious that women and mothers have more influence on youths in teaching them environmental matters. As mothers received 54.5% of the responses as to who has influenced them most in the teaching of environmental management.

Analysis of findings on indigenous environmental education

This section deals with analysis of data on the available and level of indigenous form of environmental education in Ogbomoso town. As obtained in Table 3, respondents who learnt indigenously about the environment from elders in their pre-school age are 74%, while those who did not are 26%. This shows that indigenous forms of educating children are still prevalent and valued.

As shown in Table 3, the categories of respondents who learnt environmental sanitation through folklores were 1.9%, those through folk drama form 2.2%. Folk stories took 24.2%, folksongs form 13.8%, village meetings were also used and amount to 15.6, while the commonest form which is through the use of taboos is 42.2%. Folk songs are generally through oratory skills composed as poem and chants. Village meetings are those summoned by elders for passing out information about projects or the town itself. Taboos are prohibitions or strongly forbidden acts by social customs of the people. Taboos are the commonest forms adopted in

Table 3. Findings on indigenous environment.

Presence / absence of childhood indigenous learning	Frequency	Percentage
YES	222	74%
NO	47	26%
Total	269	100%
Major Forms of Indigenous Methods Used	**Frequency**	**Percentage**
Folklores	5	1.90%
Folk drama	6	2.20%
Story telling	65	24.20%
Folksongs	37	13.80%
Village meetings	42	15.60%
Taboos	113	42.00%
Total	300	100.00%
Effectiveness of Indigenous Methods	**Frequency**	**Percentage**
Very effective	47	32.60%
Not effective	25	17.40%
Slightly effective	72	50.00%
Total	144	100.00%
Perception of Women's Role in Environmental Awareness	**Frequency**	**Percentage**
Yes	228	76%
No	72	24%
Total	300	100%
Women's Contribution to the Environment	**Frequency**	**Percentage**
Cleaning of Environment	132	44%
Caring for Children	90	30%
Washing	78	26%
Total	300	100%
Suggestion for Better Women's Participation	**Frequency**	**Percentage**
enlightenment and education for women	114	38.00%
provision of cleaning facilities	69	23.00%
giving of incentives by government	59	19.70%
encouragement and appreciation from men	58	19.30%
Total	300	100.00%
Who to Be Blamed For Filthy Condition	**Frequency**	**Percentage**
The people	12	37.30%
Government	88	29.30%
Waste disposal workers	42	14.00%
Television stations	0	0%
Radio stations	3	1.00%
Market women	43	14.30%
Others (Everyone)	12	4.00%
Total	300	100.00%

passing indigenous education, as it amounts to 42%. They are usually embedded in the folklores. The major ones sited are either related to the general cleaning of the environmental, disposal of refuse and eating. Some of which include among others that: It is forbidden in the traditional Yoruba setting to stand at the entrance of the house while eating. The consequence being that spirits will empty contents of the offenders' stomach, hence he/she will not be satisfied. The real reason being to avert food passing through the wrong passage, as the person will be forced to answer people at the door. It is prohibited for a Yoruba person to knee on refuse heaps, as it is said that infection on the knee call 'kunle katan' could afflict anyone doing that. Also leaving of melon chaffs until the following morning, as this will cause the housewife to have bad dreams; others is that it is

prohibited by anyone to sit on the mortar, as one can develop backache, but is really meant to prevent polluting the utensil used for pounding food. Furthermore, anyone carrying refuse with bare hands will develop shaky hands, but this is to avert diseases such as cholera and dysentery when the same hand is used for eating without being washed.

The survey from Table 3 shows that the indigenous methods have been effective but not so effective. In essence, it still has impacts on the people, and would only need polishing and reconstructing to be more effective. From the research, the most effective role in environmental management has been attributed to women, as 76% of the respondents believe women are more concerned with the cleanliness of the environment than men. Though 24% are of the view that everyone is involved and that most times women generate more dirt than men as regard marketing. Also women contributed greatly to the environment as observed by the respondent in Table 3 which shows that women participated actively in terms of cleaning of environment (44%), caring for children (30%) and washing (26%).

Regarding suggestion for better women's participation, it was suggested by respondents that there is need for enlightenment and education of women having (38.0%), provision of cleaning facilities (23.0%), giving of incentives by government (19.7%), encouragement and appreciation from men (19.3%). But either way, it is significant to note the pivot of the community development there is need to plans to educate the women. The people see themselves as the major cause of the environmental problems in Ogbomoso, but seem not to be able to help themselves. They believe a large percentage of the blame goes to the government and waste management workers too, for not rightly mobilizing and helping them out of their predicaments by doing their job. Though a large percentage of the people from the survey seems to be conscious of environmental problems, it is obvious that majority are not in the best frame of mind as regards proper knowledge of handling the situation, as it is the case generally with many Nigeria cities. It is obvious that government will have to put in a lot in area of educating them and making extra effort to carry them along through the various systems that have been quite effective on them indigenously. To bring out the best, it is only then that effective environmental management can occur. In other words, attention should be on people since they are the main problem.

Evaluating regression coefficients of resident's environmental consciousness

The standard coefficients (Beta) give a picture of the relative importance or influence of the independent variables on resident's level of environmental consciousness. The higher the magnitude of Beta, the more the influence of the variable is. Tables 4 and 5 show the overall statistics of the results obtained from the regression equation between resident's level of environmental consciousness and socio-economic characteristics. From Table 4, the regression analysis reveals that only variables such as income level (0.285), level of education (0.180), hours spent during the day (0.655), residential duration occupation (0.287), length of residency (2.238), medium of information on environmental problems (0.228), childhood indigenous learning (0.344), forms of indigenous methods used (0.202), women's contribution to the environment (0.110), environmental problems (1.974), offensive odour around homes (0.285), and adult influence on respondents environmental awareness (1.229) are found to be related to resident's level of environmental consciousness, while variable like sex composition, (0.243), age (1.349) and indigenous composition (0.302) are not related to resident's level of environmental consciousness. The analysis of variance test yielded an F- value of 114.07, while the R-squared (R^2) value indicates that 46.1% of the variation in resident's level of environmental consciousness with socio-economic characteristics is determined by the explanatory variables (Table 3). The Simple linear regression in Tables 4 and 5 explained the relationship between education, level of environmental consciousness of the people, income level and others. This shows that education level and income levels of people determined their disposition towards the environment and on the relevance and extent to which level of environmental consciousness is determined by the socio-economic characteristics in Nigeria.

Discussion of findings

The basic aim of this study was based on the fact that education of people and raising their level of consciousness will effectively help participation, which is the latest resort to sustainable environment management. The general outcome from the research has been that some efforts have been made by the government through the media and schools, to stimulate the people. But the majority who live in the core areas, centre of problems are left out. The little awareness or perception they have does not make much difference, they are only being sustained by the traditional knowledge they have acquired form the community. The formal school curriculum on the environment is good and a force on its own, but has not totally been effective and all embracing, while the indigenous methods have neither be accorded the value it carries in sensitizing the people to proper understanding and motivation.

Furthermore, the potential of women's contribution to the environment as the major forces of community development have not been tapped. If the focal forces which are women are the less enlightened sex, left out

Table 4. Regression coefficients of level of resident's environmental consciousness and socio-economic characteristics.

S/N	Variables	B	Std error	Beta	t	Sig (P)
	(Constant)	1.568	0.141		3.869	0.960
1	Sex Composition	0.243	0.460	0.100	5.317	0.250
2	Age	1.349	1.501	0.098	0.899	0.371
3	Income Level	0.285	1.014	0.031	0.281	0.001
4	Level of education	0.180	1.090	0.018	0.165	0.026
5	Hours spent during the day	0.655	0.460	0.433	5.229	0.000
6	Residential Duration	0.287	0.032	0.228	4.761	0.000
7	Occupation	2.238	1.287	0.243	1.738	0.042
8	Indigenous Composition	0.302	0.029	0.322	5.028	0.889
9	Medium of Information on Environmental Problems	0.228	0.027	0.214	8.284	0.004
10	Childhood Indigenous Learning.	0.344	0.048	0.377	3.668	0.000
11	Forms of Indigenous Methods Used	0.202	0.035	0.226	5.018	0.012
12	Women's Contribution to the Environment	0.110	1.246	0.011	0.088	0.000
13	Environmental Problems	1.974	1.305	0.191	1.513	0.000
14	Offensive odour around Homes	0.285	1.014	0.031	0.281	0.023
15	Adult Influence on Respondents Environmental Awareness	1.229	0.032	0.128	-2.761	0.001

P significant at P≤ 0.01.

Table 5. The overall F-test value from the regression of resident's level of environmental consciousness and socio-economic characteristics.

Simple R	R-square	Standard error	Analysis of variance	Sum of squares	Df	Mean square	F	Sig. (P)
0.679	0.461	0.865	Regression	1280.94	15	85.396	114.013	0.000
			Residual	3990.18	5330	0.749		

P significant at 0.01.

and not recognized as shown from the research, not much would be achieved as it is evident. Generally, the government has not really made real strategic plan towards accurately sensitizing the masses and their ultimate in environmental management participation. They have inevitably shown they left the people to their own fate by not taking extra measure to inculcate in them, the necessary knowledge that would prevent them from environmental dangers. The little done were passed across in the language majority did not understand, thus hindering enough educative information about environmental problems.

The Indigenous Learning Process; In line with the study, the ways by which indigenous education was passed to the people are through folklores, fold drama, storytelling, folk songs, village meetings and taboos. While folklore is the traditions, customs and beliefs of a community; Folk songs or music are the chants embedded in the traditional life style while folk stories are the various tales popular with traditions, beliefs and customs passed on from generation to generation. All these forms to bring about proper socialization of a child into the community to which he / she is born, that must be done during the early childhood stage or pre-school phase to abide and form the background of their life successfully.

RECOMMENDATIONS

An all-embracing education system should be focused on in motivating the masses. Without this the people would be like unsharpened axe which will take 100 years to fell a single tree. But when sharpened, will make work faster, effective and possible. It is clear from the survey data that the indigenous forms of education need to undergo major reforms in goals and methods, if they are to perform their educative role effectively. Thus by introducing effective and workable indigenous methods in conjunction with the formal education method through either the mass media or schools, will build a very strong society that is environmentally conscious and sustainable. Women's forum should be organized to specially train women. More programmes on radios, television and village meetings should be more targeted towards building a problem and pollution free environment Indigenously, stage dramas, play lets and films in traditional forms should be produced and freely distributed through community organizations

and local government to various settlement matters, with the ultimate goal of enlightening them towards environmental matters and threatening issues.

Penalties should also be incorporated and be implemented through the local chiefs and obas (king). This is because of two advantages: laying hold on traditional heads will lead to effective and comprehensive hold on the little settlements under them. In all, many settlements can be effectively taken care of this way without much burden on the central government and state government and secondly the closeness and the understanding that exist between these chiefs and their people will lessen the job to be done and make it easier. It is an acceptable fact by now, that the better the people's understanding of the environment, the more effectively, it can give support to development. Hence, planners will need to venture outside their 'sphere of influence' and moved from the era of "blue prints" to the height of citizen participation. A general awareness of the environment and its associated problems is however required among policy makers and the public for better integration of environmental concerns into development planning. A planner's education ought to include exposure to the ways of life and attitudes of mind of the whole range of people he is to serve Also, as noted earlier, these in need for continuous research to enlighten individuals, communities and government about the nature of the environment problems and the best ways of coping with them.

For planners and architects to design and plan a better environment devoid of pollution and other environmental problems there is need to incorporate environmental concerns into our educational curriculum as well as in the programme of public information and awareness. This implies that environmental problems are essentially, people centred. Participation and support are therefore necessary in solving these problems.

Conflict of Interests

The author has not declared any conflict of interests.

Conclusion

The argument of this paper is that since the advantages of this informal learning system have been known, it should be incorporated into the nation's learning system for the overall benefit of the environment and the people that live in it. Until we know our individual and or joint responsibilities to our environment, we will not be able to relate much more intimately and effectively with the environment. But we will not know these responsibilities until we are adequately sensitized through the various learning systems and especially by capitalizing on the informal which is the most enduring and the most pervasive of these systems. It is now time to formalize this hitherto informal learning system through its integration into the curriculum for sustainable health of the Nigerian environment and its people. Government should acknowledge public's substantial power to slow or stop regulatory or permit activities. Once this is done, a reduction in community resentment is guaranteed for government policy. Thus, people and the type of education given to them should be major agenda on environmental management issues now, for all to be well.

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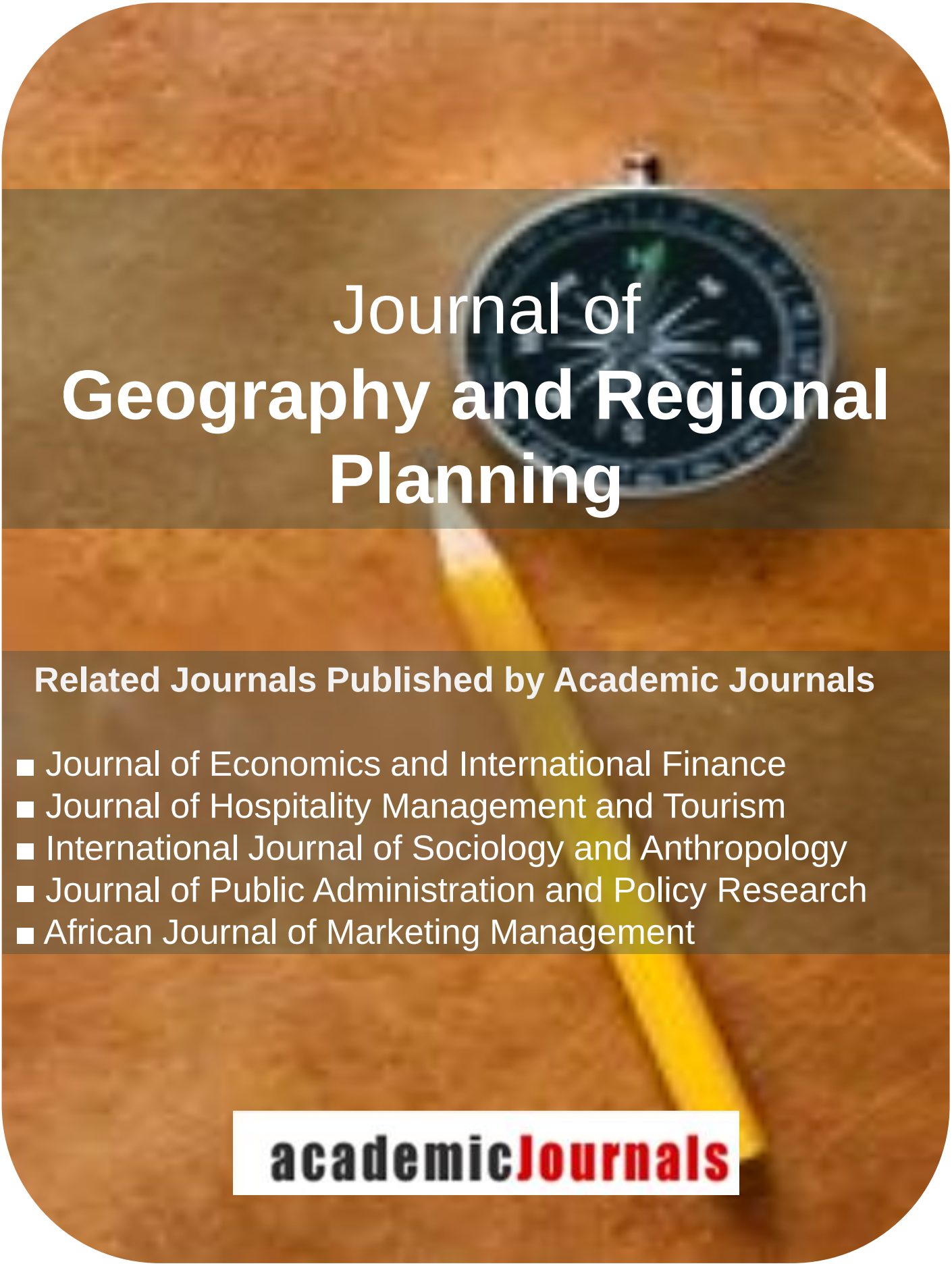

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