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Sustainable infrastructure provision through awareness in selected medium-sized towns in Kwara State

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Abstract. Infrastructure is a basic structure required for sustainable socio-economic and physical development of any human settlement. The issue of sustainable development has recently been linked to infrastructure sustainability. Required to achieve this is the acquisition of appropriate education. Different skills, understanding the complexities that threaten the survival of our system, critical and systematic thinking, building capacity and partnership in decision-making, which are essential tools for Education for Sustainable Development (ESD), are required to provide adequate, appropriate and functional infrastructure. This study therefore examines the awareness/knowledge with reference to various skills employed in the provision of infrastructure through communal efforts in ten selected medium-sized towns in Kwara State. These towns are with a population of between 5,000 and 20,000. A total of 400 household heads were sampled systematically through the administration of a questionnaire in the ten selected medium-sized towns. Tabulations, cross tabulations, percentages and chi-square analysis were employed to analyse the gathered data. The findings revealed a significant relationship between awareness/knowledge and the provision of infrastructure with a calculated value of 219.23 greater than the tabulated value 34.41 at alpha level 0.05. Indigenous knowledge coupled with the ideas brought home by indigenes that have travelled far from their immediate communities and some professional skills acquired through community participation in infrastructure provision were employed to provide basic infrastructure required for socio-economic and physical development. Among the infrastructure provided are water, roads, health centres and electricity. The study recommends the improvement of basic education, a review and re-orientation of our educational system to address sustainability for proper collaboration of community efforts with the Community Development division of various local governments. This could be through training of the local communities and promotion of partnership zeal with Non-Governmental Organizations (NGOs) in infrastructure provision.

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Contents:

1. Introduction

For any modern human settlement to function effectively, sustainable infrastructure provision would be required because infrastructure is intimately linked to urban development. This statement supports the assertion by Afolayan (2008) that no modern human settlement can grow, develop and function effectively without water, sanitation facilities, modern market and communication media among others. This belief is all about sustainable development. The issue of sustainable development has recently been linked to infrastructure sustainability. Sustainable development simply means development that meets the needs of the present and the future generations. People in this respect should be able to manage and maintain the infrastructure in each settlement for the benefit of future generations. Required to achieve this, therefore, is the development and acquisition of educational skills which border on understanding the complexities that pose a threat to the survival of our systems, critical and systematic thinking, building capacity and partnership in decision-making. All these are essential tools of education for sustainable development ESD as observed by Tilbury and Wortman (2004) Szymańska and Chodkowska-Miszczuk (2011). To determine the effect of infrastructure provision on development, Dowall (1994) developed a regression model on the price of land in Karachi, Pakistan and came up with estimation results which were highly significant. This shows the awareness of the people in the provision of infrastructure for sustainable development.

In Nigeria, rural and medium-sized towns are mostly marginalised in the provision of basic urban infrastructure when compared with large urban centres. Most of these marginalised areas are characterised by inadequacy and dysfunctional infrastructure services which result in traffic congestion, inadequate and dysfunctional water system, sanitation and sewerage facilities and an unreliable electricity supply. This situation does not guarantee the sustainable development of any human settlement. In recognition of the importance of infrastructure in the development of human settlements, various efforts have been made over the years by various governments and private sectors including local communities to develop strategies and policies to spread these services to all segments of human settlements. These efforts, which are yet to achieve the desired goals, are manifested in various National Development and Rolling Plans in Nigeria. Medium-sized towns in this study are classified as settlements with a population of between 5,000 and 20,000 (Afolayan, 2008).

The study therefore focused on the assessment of the awareness/knowledge of infrastructure provision and maintenance through community efforts in the ten selected medium-sized towns in Kwara State. The following specific objectives were pursued: identification of the type of infrastructure

available and its initiators in the study area; assessment of the knowledge/awareness employed (skills employed) in the provision of infrastructure and its maintenance; and assessment of the level of importance of infrastructure and functionality. The infrastructures selected for this study are schools, roads, electricity, water and health facilities. These are infrastructures which are commonly provided by an individual group within a community and are also perceived as either having a positive or negative impact on sustainable urban development.

2. Education and sustainable development

Education for sustainable development can be regarded as the practice of teaching for sustainability. It is a term used internationally most of the time by the United Nations. According to McKeown (2002), Agenda 21 was the first international document that identified education as an essential tool for achieving sustainable development and highlighted areas of action for education. Education for Sustainable Development is a practice whereby every human being is allowed to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future. It requires participatory teaching and learning methods that motivate and empower learners to change their behaviour and take action for sustainable development. Education for Sustainable Development consequently promotes competencies like critical systematic thinking, envisioning and making decisions in a collaborative way. All these are aimed at ensuring sustainability in all development efforts. Education is therefore held to be the focus for sustainability.

3. Education and awareness

Education, (formal, informal and non-formal education) are indispensable to changing people's attitudes so that they have the ability to assess and address their sustainable development concerns. It is also critical for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in decision-making. UNESCO/BREDA (1998) laid emphasis on the term 'knowledge society', which has been accepted in recent years due to the revolutionary strides in technology and the rapid evolution of new systems for the gathering, transmission and application of information. Increasing formal environmental education opportunities through awareness would result in enhanced knowledge about infrastructure sustainability.

Awareness as a form of education can be defined as actions directed at people to improve understanding and skills, and influence behaviour. Awareness means to have knowledge or to be well informed about what is going on in the world. According to UNEP (2012) education is a form of public awareness and so should be recognised as a process by which human beings and societies can reach their fullest potential. Education as an awareness is very critical in promoting sustainable development and improving the capacity of the people to address environment and development issues. According to Opateye (2012) awareness (knowledge) has always been an important and distinguishing characteristic of human society. This is because human beings are unique among all species in their extended capacity to formulate, systematise, preserve and consciously transmit organised bodies of knowledge from one individual, community, generation and location to another.

4. Infrastructure provision and awareness

Infrastructure generally deals with the fixed provision of tangible assets on which other intangibles can be built. It involves the provision of health facilities, housing, power (electricity), transport, education, communication, and technology (Ojuola, Martin, 2012). In infrastructure provision, the level of awareness is an essential factor in ensuring a successful implementation of any new policy. In public infrastructure, the level of the public's awareness of private sector involvement in infrastructure development must be assessed in addition to the areas of private sector involvement in infrastructure development.

5. Study area

This study is concentrated on medium-sized towns of Kwara State (Fig. 1). The growth of medium-sized towns in Nigeria has been linked with the urbanisation process. This is as a result of the movement of people from rural to urban areas for various reasons. In an attempt to compare medium-sized with larger towns, Okafor (1985) emphasised that medium-sized towns blend both urban and rural features sharing similar physical economic and social traits, except that the level and magnitude of economic and social activities differ. Medium-sized towns are the interface between large urban centres and rural areas. While stressing the roles of medium-sized and small towns, Okafor (1985) stressed that these towns serve as a relief to large cities by absorbing populations that are often experienced in the large cities. However, for the purpose of this study medium-sized towns are towns with a population of between 5,000 and 20,000 (Afolayan, 2008).

In Kwara State, there are about 4,000 settlements of different sizes and population out of which there are a few large urban centres, which include Ilorin, Offa and Omu-Aran with 532, 088, 74,326 and 35,350 people (NPC, 1991) respectively. These settlements constitute 42% of the total population of the state while the remaining settlements can be regarded as medium-sized towns and villages representing 58% of the total population, where most agricultural production occurs.

6. Methods of study

Of the twenty-seven (27) identified medium-sized towns in Kwara State (Afolayan, 2008), 10 (see Table 1) were randomly selected for this study. In each of the selected 10 settlements, 40 buildings were systematically (every 5th building) selected along all the major roads, and in each of the selected 40 buildings, only one household head was sampled. This translated to having a total of 400 respondents to whom a structured questionnaire was administered. The variables considered for this study include the following: type of available infrastructure; its initiators; the knowledge/awareness employed (skills employed) in the provision of infrastructure and its maintenance; and the level of importance of infrastructure and functionality.

Table 1. Demographic population of selected medium-sized towns

Medium-sized towns	Population
Ajase Ipo	8,954
Isanlu-isin	6,454
Iloffa	8,030
Idofian	5,519
Ijagbo	8,186
Odo-Owa	11,967
Ojoku	5,095
Oke-Ode	6,734
Otun Oro	8,012
Share	15,359

Source: National Population Commission, 1991

To complement the information gathered through the questionnaire, the community heads of the selected settlements, the head of one of the community associations and the principal of one of the secondary schools in each of the selected settlements were interviewed.

The obtained data were organised and summarised using tabulation/cross tabulation and percentages respectively. This enabled descriptive analysis of data collected in respect of objectives one, three and four, while inferential statistics of Chi-square (X^2) were employed to examine the relationship between knowledge employed and infrastructure provision.

7. Results and discussion

7.1. Type of infrastructure available and its initiators

The study revealed a high level of awareness/knowledge of the importance of provision of infrastructure and maintenance. This lends credence to the magnitude of infrastructure provision through communal efforts notwithstanding the variation in the type of infrastructure as indicated in Table 2. This therefore implies that these communities are highly aware of the importance of infrastructure to the socio-economic and physical development of human

settlements. It can also be further inferred that government marginalisation of infrastructure provision in the medium-sized towns has necessitated the need for the people to be conscious of the importance of these services in the various settlements. It is worth mentioning that the state and local governments have equally provided common infrastructure to all the towns. These include secondary schools, commonly tagged government secondary school, pipe-borne water, hospitals and clinics also tagged government hospitals and clinics and road networks which connect the urban centres nearer the settlements. However, the maintenance of this entire infrastructure including that provided by the communities is handled by the state and sometimes by the local government.

Table 2. Identification of community infrastructure provision

S/N	Community	A	B	C	D	E
1.	Ajase-Ipo	2(2)	2(6)	1(5)	11(4)	1(1)
2.	Isanlu isin	1(3)	4(5)	1(5)	10(5)	0(0)
3.	Iloffa	2(2)	6(3)	2(4)	35(2)	1(1)
4.	Idofian	1(3)	5(4)	1(5)	20(3)	1(1)
5.	Ijagbo	2(2)	4(5)	1(5)	2(9)	0(0)
6.	Odo-Owa	3(1)	8(1)	1(5)	7(6)	1(1)
7.	Ojoku	1(3)	7(2)	2(4)	48(1)	0(0)
8.	Oke-Ode	0(0)	5(4)	3(2)	5(7)	1(1)
9.	Otun-Oro	0(0)	4(5)	4(1)	3(8)	1(1)
10.	Share	1(3)	4(5)	3(3)	3(8)	0(0)

Explanation: A – schools; B – water services; C – health services; D – length of roads; E – electricity

Source: Authors' fieldwork, 2013 Numbers in parenthesis rank order (1) – (10) = Rank

The role of leaders of community elites in the provision of infrastructure is very much emphasised. These leaders may be assumed to be exposed to their outside local environment, hence their initiation of infrastructure provision to sustainable development. This is followed by community leaders, Obas, and Chiefs (see Table 3). It can equally be inferred that religious leaders and associations are also aware of the role of infrastructure in development.

Table 3. Initiators of infrastructure provision

Initiators	Frequency
Obas, chiefs	80
Community leaders	100
Leader of Community Elites	150
Leaders of religious group	80
Leader of association	15
Others	2
Total	400

Source: Authors' fieldwork, 2013

7.2. Knowledge/awareness employed (skills employed) in the provision of infrastructure and its maintenance

This clearly acts as the first step to ensure the functionality of these services, hence their sustainability. The community is knowledgeable of the need to employ Town Planners who will advise them in the siting of schools to ensure easy accessibility. Also engaged by the community are the skills of professionals: engineers, local bricklayers and local plumbers. The use of indigenous knowledge applicable to their culture in clearing areas for buildings and road construction supports their level of awareness in infrastructure provision (see Table 4). Employing the services of these professionals indirectly implies that the citizens are working in partnership with the professionals. These actions have confirmed that the citizens have the understanding and skills especially with regard to employment of professionals in the provision of infrastructure for sustainable development. This is in support of public participation in Education for Sustainable Development programmes. To examine the relationship between knowledge/skills employed and provision of infrastructure and maintenance, chi-square analysis was employed and the result showed that there is a relationship between knowledge/skills and provision of infrastructure since the calculated value 219.23 is greater than the tabulated value of 34.41 at alpha level 0.05. Furthermore, the study revealed that communities are aware of where to find these professional skills. This means the inhabitants know the roles of these professionals in the provision of sustainable infrastructure. It also implies that communities are focusing on skills and values in identi-

fying sustainable goals, which is one of the cardinal principles of education for sustainable development.

Table 4. Knowledge/skills employed by the communities in the provision and maintenance of infrastructure

Knowledge/skills	A	B	C	D	E
Civil Engineers	20	3	2	5	30
Electrical Engineers	15	5	25	15	0
Town Planners	20	5	10	5	10
Local Bricklayers	50	5	2	13	10
Local Plumbers	70	30	3	5	2
Indigenous	50	10	10	15	15
Total	165	58	52	58	67

Explanation: A – schools; B – water; C – electricity; D – health centre; E - roads

Source: Authors' fieldwork, 2013

7.3. Assessment of the level of the importance of infrastructure and its functionality

The study revealed that communities have knowledge of the impact of infrastructure on the development of human settlements (Table 5). Improvement of environmental quality has been indicated by 180 (45%) as the major impact of infrastructure on sustainable development. This implies that people are aware of the relationship between infrastructure and sustainable development. The socio-economic reason was recorded by 120 (30%) respondents. This reason can be attributed to the fact that socio-economic activities are required in the sustainability of any human settlement in terms of growth. About 49 (12%) respondents indicated that infrastructure could promote education.

For any type of infrastructure to be sustainable for present users and future generations, such infrastructure should be functional. The general assessments of these infrastructures as indicated in Table 6 will ensure sustainable development of any human settlements if adequate measures are taken in the management and maintenance of infrastructure assessed to be fair.

A total of 148 (37%) respondents revealed that inadequate financial support has been a constraint to infrastructure provision. This could be due to the concentration of infrastructure in the state capital. Following this is a lack of adequate professional skills available in their local environment in 124 (31%) cases (Table 7). This stresses the need for professional skills in the provision of infrastructure. However, the communities embarked on systematic thinking to search for professional skills from other sources which support one of the skills essential to ESD, which is the ability to find solutions to problems.

Table 5. Importance of infrastructure to sustainable development

Awareness/ Knowledge	Frequency	Percentage
Improvement of environmental quality	180	45.0
Socio-economic Services	120	30.0
Improved Health Services	42	10.2
Diffusion of Innovation	9	2.5
Promotion of Education	49	12.2
Total	400	100

Source: Authors' fieldwork, 2013

Table 6. Functionality of provided infrastructure

Medium-sized town	Infrastructure																			
	Schools				Water				Health Facilities				Road				Electricity			
	VG	G	F	I	VG	G	F	I	VG	G	F	I	VG	G	F	I	VG	G	F	I
Ajase-Ipo	20	10	5	5	10	15	5	2	20	10	5	5	20	5	10	5	0	10	20	10
Isanlu Isin	10	15	10	5	8	8	5	3	10	15	10	5	21	9	5	5	0	5	35	0
Iloffa	20	10	9	1	5	5	15	5	11	19	5	5	15	20	2	3	0	5	30	5
Idofian	20	11	8	1	7	9	15	9	15	15	5	5	22	12	3	3	0	2	38	0
Ijagbo	21	10	7	2	6	7	15	12	10	10	15	5	15	8	8	9	1	2	37	0
Odo-Owa	15	15	5	5	5	16	7	12	10	15	10	5	19	11	5	5	2	28	10	0
Ojoku	20	11	6	3	7	15	12	6	17	12	5	6	17	12	6	5	1	19	20	0
Oke-Ode	10	15	11	4	10	15	5	10	11	3	7	11	15	10	10	5	0	10	30	0
Otun-Oro	15	13	10	2	20	10	5	5	15	10	7	8	16	12	10	2	0	10	30	0
Share	17	8	10	5	15	15	5	5	18	17	2	3	19	11	5	6	0	0	35	5

Explanation: VG=Very good, G=Good, F= Fair, I= Indifferent

Source: Authors' fieldwork, 2013

Table 7. Constraints to effective infrastructure

Constraints	Frequency	Cumulative %
Financial support from government	148	37.0
Lack of adequate funds from government	98	24.5
Lack of professional skills in the community	124	31.0
Wrong choice of project	30	7.5
Total	400	100

Source: Authors' fieldwork, 2013

According to Tilbury and Wortman (2004), systematic thinking acknowledges complexities and looks for links and synergies when trying to find solutions to problems.

8. Conclusion and recommendations

The study has adequately revealed that there is a high level of awareness in the provision of infrastructure by the communities in the ten medium-sized towns. This goes further to infer that these communities are aware of the importance of infrastructure to the development of human settlements. The ability to assess the functionality and to identify constraints in the provision of infrastructure is an indication of their awareness of infrastructure in sustainable development. It can be inferred from this analysis that appropriate skills essential to sustainable development was used to achieve this. Indigenous knowledge coupled with the ideas brought home by indigenes that have travelled far from their immediate communities and some professional skills acquired through community participation were employed to provide basic infrastructure required for socio-economic and physical development. Among the infrastructure provided are schools, water, roads, health centres and electricity. The study recommends the improvement of our basic education, a review and re-orientation of our educational system to address sustainability for proper collaboration of community efforts with the Community Development division of various local governments through (vocational) training of the local communities and promotion of partnership zeal with Non-Governmental Organizations (NGOs) in infrastructure provision. Public participation in infrastructure provision is expected to adopt some measures. These include taking part in decision-making, contributing to the development effort and being part of benefit sharing. These activities would require appropriate different professionals in the provision of varied infrastructure. Where professionals are not available within the communities, technical assistance should be provided by the government or any appropriate agencies. A typical example is the secondary school project of Kwekwe town, Gutu area in Zimbabwe, where technical assistance was provided by UNCS (HABITAT) to the ministry of national housing with USAID providing the capital cost.

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