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INFRASTRUCTURE PROVISION AND CLASSIFICATION OF RURAL SETTLEMENTS IN NIGER STATE, NIGERIA

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Abstract

This study classifies the selected rural settlements on the basis of available infrastructure .To achieve this aim, 22 rural settlements were randomly selected. The cluster analysis was applied on the data in order to group the rural settlements on the basis of their infrastructure profiles. Thus the hierarchical method of cluster analysis was applied using version 16.0 of SPSS package. The study revealed that three groups of settlements labelled A, B and C was produced by the hierarchical clustering technique based on availability of infrastructure. It was observed that although the

quantity of infrastructure varied among the settlements, group B settlements consisting of Doko, Enagi, Kuta, Maikunkele, Paiko, Sabon Wuse, Sarkin Pawa and Wawa seem to have more infrastructure than group A and C settlements. Group A settlements consisting of Agwara, Gawu Babangida, Gulu, Lemu, Nasko, Tegina and Tunga Magajiya appear to have more provision of infrastructure compared to group C settlements. On the other hand, group C settlements consisting of Baddegi, Bangi, Gbajibo, Kutiriko, Mashegu, Rafin Gora and Wushishi appear to be the least in terms of provision of infrastructure. There is the need to sustain the Ward Development Projects which was introduced in 2008 by the Niger State government. It is suggested that the monthly allocation to the wards be increased, while more community participation in project initiation, identification, monitoring, implementation and evaluation should be encouraged.

Key words: Infrastructure, Rural Settlements, Classification, Cluster Analysis, Hierarchical Method, Rural Transformation.

Introduction

There is no doubt that equitable and adequate distribution of infrastructure within rural areas will trigger rural transformation, enhance socio-economic development, and improve the quantity of rural life. However, available literature indicated that a great proportion of the rural population still remains deprived (Olayiwola, 2001). Thus, the most display of Nigeria's underdevelopment is the rural areas. Consequently, several authors have documented the nature of the infrastructural problems in rural areas of the country, for example, Obiukwu (1992) reports that the condition of the Nigeria rural areas is evidently deplorable. This is because the rural areas which harbour over 70% of the country's million people, is lacking in the basic infrastructure that are required to meet the needs of modern man. Similarly, Idike (1992) reports that in many rural areas in

Nigeria where basic infrastructures exist, the infrastructures are inadequate for any meaningful development. According to him, physical infrastructures like motorable roads are often lacking, and the villages and their livestocks in many rural areas depend on shallow wells and guinea worm-infested ponds for their water supply. In the same vein, Ebehikhalu (2004) reports that in the rural areas of Nigeria, electricity, potable water supply, teaching and specialist hospitals which are generally concentrated in the urban centres are just illusive. Thus, the people living in the rural areas lack the necessary attributes and means, which could have been used as catalyst for rural transformation and development.

There is no doubt that availability of rural infrastructure constitutes the substance of rural welfare. Idachaba (1985) emphasises that efforts to raise rural welfare must necessarily go beyond the traditional and limited approach of raising per capita income through agricultural development projects, to the provision of rural basic needs such as health and medical facilities, electricity, pipe-borne water and schools. Thus, rural Nigerians must be appreciated beyond their roles as mere producers of food and fibre for the need of urban economy, to their roles as consumers and citizens who were equally entitled, like their urban counterparts, to the good things of life (Idachaba,1985) .It is against this background that this paper classifies rural settlements in Niger state of Nigeria on the basis of available infrastructure.

Concept and classification of settlement

The term 'settlements' is a geographical concept describing an inhabited built up area of land occupied by people for shelter and other socio-economic activities. It is a group of building in which people live in order to make a living out of the environment. However, the units of settlements vary in size, complexity of function and stage of development (Adegunwa, 1986, cited in Olawepo, 1997;

and Jolayemi, 1992). It therefore follows from the above that a settlement could be classified as either rural or urban.

However, the problem of defining rural settlements is complex because the criteria for defining urban/rural areas tend to differ from one discipline to another, from one nation to another or from one culture to another and even from one period to another (Onakerhoraye and Omuta, 1986). In Africa, for example, the definition of urban/rural areas varies from country to country and within each country from time to time. The only form of data that is available in African countries as far as urban/rural definition is concerned is demographic. As a result, many scholars use demographically based definition in distinguishing urban settlements from rural settlements. Consequently, Okafor and Onokerhoraye (1986) note that in view of a wide variety of figures used by different countries most researchers use the United Nations Economic Commission for African's definition as follows:

(a) Locality with 500,000 or more = Big city
(b) Locality with 200,000-499,999=medium city
(c) Locality with 100,000-199,999 = City
(d) Locality with 20,000-99,999 = Urban locality
(e) Locality with less than 20,000 rural localities.

The categorization therefore defines settlement with 20,000 or more inhabitants as urban while places with less than 20,000 people are regarded as rural settlements. In Nigeria, different types of population size at different time had been adopted to differentiate between urban and rural settlements. For example, in 1953, an urban settlement was defined as a settlement with a population of 5,000 or more while in 1963, the figure used was 20,000 or more (NISER, 1997). Presently, all settlements with population of 20,000 people or more are regarded as urban settlements, while settlements with population below 20,000 are rural settlements (NPC, 1998; Omole, 2000; Abumere, et al 2002; Olujimi, 2005).

Apart from using demographic statistics to define rural settlements, socio-economic characteristics have also been used to distinguish rural settlements from urban settlements. For example, Wolfe and Fischer (2003, cited in Madu, 2008a) argue that there are features that are primarily marks of rural areas supported by distinctive cultural patterns which are usually exhibited by people residing in rural areas. In accordance with the primary and cultural perspectives, rural settlements have been characterized by specific open landscape; a relatively low population; the greater part of the population is associated with agriculture and forestry; traditional (close to nature) life style and habits; extensive use of land; a scarcity of built up areas and settlements that are dispersed; and a preponderance of inhabitants considering themselves country dwellers (Halfacree, 1995, Banski and Stola 2002; cited in Madu 2008b).

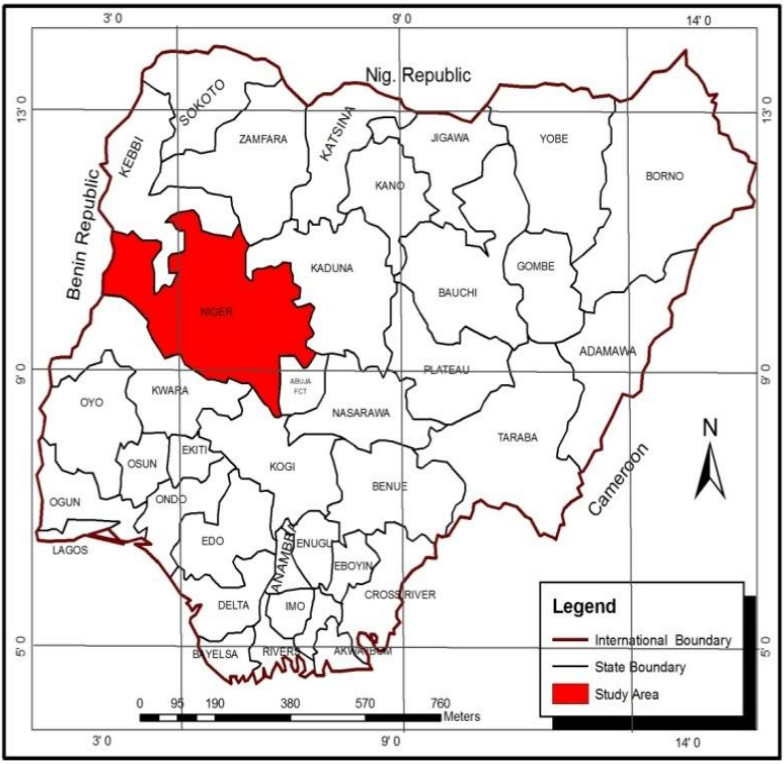
This is in agreement with, Adedayo (1998) who has earlier noted that rural settlements are generally regarded as areas of a region or country that lie outside the densely built-up environments of towns, cities and suburban villages whose inhabitants engage in primary as well as rudimentary forms of secondary and tertiary activities. They are made up of settlements which in their simplicity of form and function reflect the essential agricultural environments (Areola, 1987). Lawrence (1990) describes rural settlements as areas where rate of poverty and unemployment are high and the range of work opportunity is much narrower. Similarly, Wimberly (1993) describes rural settlements as places having higher rate of unemployment and mortality and less access to education and employment, training and other human services that urban areas take for granted. Using socio-economic attributes, Omole (2001) describes rural settlements as areas where the majority of the inhabitants are engaged in primary activities like farming, fishing, mining, lumbering and so on, where the per-capita income is significantly lower than the national average, and where the population lacks basic social amenities such as good drinking water, electricity and so on.

Obasanjo and Mabogunje (1991) state that rural settlements are characterized by their depleted work-force, their rudimentary and inefficient mode of production, their general lack of basic infrastructure and social amenities such as safe potable water, all season access roads, telecommunication, electricity, schools, medical facilities, good houses and recreational facilities, the paucity of processing factories, markets, banks, storage depots and machine repair shops and their low level of health care delivery, nutrition hygiene, education and social awareness. However, they also note that the, rural settlements have managed to preserve their age-old traditional and cultural linkages and heritage and thereby are more socially stable and more amenable to mobilization through respected leadership and acceptable organization. However, for the purpose of this study the demographic criterion has been used to define rural settlement.

Study Area

Niger state is located between latitudes 8° 20 ' N and 11°30' N and longitude 3° 30'E and 7°20'E. The state is situated in the North Central geo-political zone and shares its borders with the Republic of Benin (West), Zamfara State (North), Kebbi (North-West), Kogi (South), Kwara (South-West), Kaduna (North-East) and the Federal Capital Territory FCT (South-East) (Niger State Government, 2004). Figure 1 shows the location of Niger state in Nigeria. The state covers a total land area of about 76,000sq.km, or about 9 percent of Nigeria's total land area. This makes the state the largest in the country (Baba, 1993, Online Nigeria, 2003.). At inception in 1976, the state had only eight Local Government Areas (LGAs), however, with the series of state and local government creation exercises and boundary adjustments between 1979 and 1996; the number of LGAs in the state has increased to twenty-five.

Figure 1: Map of Nigeria showing Niger State.



Source: Federal Ministry of Lands, Housing and Urban Development, Abuja.

In terms of human settlements, the majority of the people of the State reside in rural areas. According to Baba (1993) for example, 90 percent of the state population were rural residents. Similarly, following 1991 population census Morenikeji, et al (2000) reported that there were 2,371 rural settlements with a total population of 1,868,939 and eight urban settlements with a combined population of

552,642 in the state making the state essentially rural. According to Baba (1993), the characteristic rural settlements in the Nupe cultural area are of the nucleated type in which each settlement consists of many compounds built in close quarters and each compound houses a family which is an in pendent production/consumption unit. On the other hand, outside Nupe territory, dispersed rural settlements predominate in northern local government areas of Mariga, Magama, Borgu and Shiroro in which the residents commonly form one unit of production/consumption. Some of the major urban settlements in the state include Minna the State Capital, Bida, Suleja and Kontagora.

Research methodology

For this study, 22 local government areas were considered for the purpose of selecting the rural settlements. The 22 local government areas were further stratified into two: namely completely rural local government areas and partially rural local government areas. The completely rural local government areas as defined here are local government areas consisting of all settlements having population below 20,000 including their headquarters, while the partially rural local government areas have only their headquarters with population of more than 20,000 while the other settlements in the local government areas have population of less 20,000.The selection of settlements was done by ranking all the settlements in each local government in descending order and selecting the first settlement with population of less than 20,000. In all, a total of 22 settlements were selected traversing 22 local government areas.

The cluster analysis was applied on the data in order to group the rural settlements on the basis of their infrastructure profiles. Thus the hierarchical method of cluster analysis was applied using version 16.0 of SPSS package. One of the simplest forms of cluster analysis is a single linkage cluster analysis, which offers a very simple way of summarizing relationships in the form of a dendrogram. This was employed to illustrate the linear combination of sample units on the basis of infrastructure profiles

Results and discussion

Infrastructural classification of the settlements

The grouping produced three different types of settlements based on availability of infrastructure. The groups are labelled A, B and C as shown in Table 1. Although, the three groups appear to have similar characteristics in the type of infrastructure provided, however, the settlements differ among the groups in the number of facilities hence, their level of infrastructural development.

Table 1: Summary of the settlements clustering

Type A Settlements	Type B Settlements	Type C Settlements
Agwara	Doko	Baddegi
Gawu	Enagi	Bangi
Gulu	Kuta	Gbajibo
Lemu	Maikunkele	Kutiriko
Nasko	Paiko	Mashegu
Tegina	Sabon Wuse	Rafin Gora
Tunga Magajiya	Sarkin Pawa	Wushishi
	Wawa	

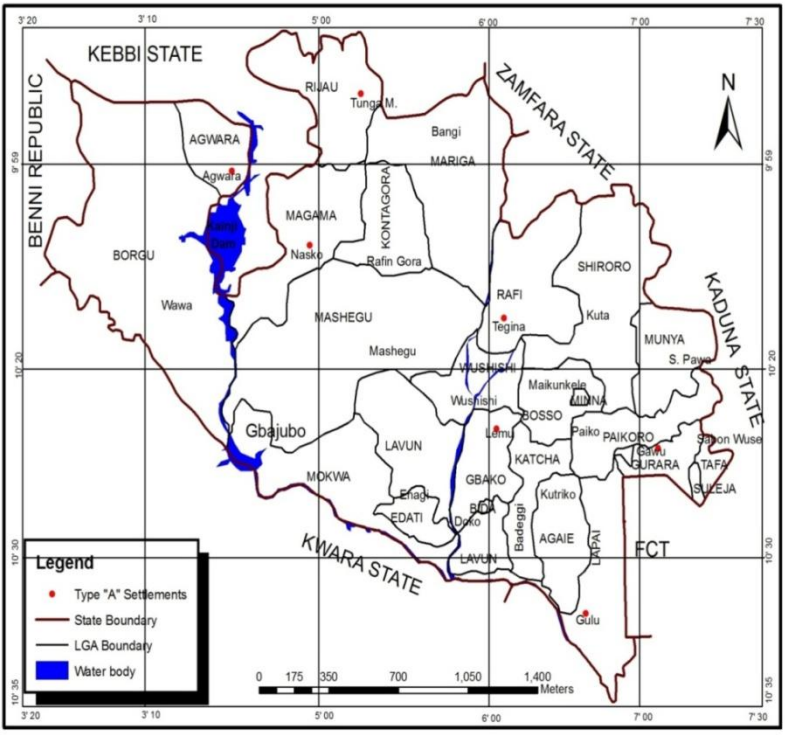
Source: Author's fieldwork, 2011.

Infrastructural characteristics of type a settlements

This group consists of seven settlements namely, Agwara, Gawu Babangida, Gulu Angwa, Lemu, Nasko, Tegina and Tunga Magajiya as shown in Table 1 and Figure 2. An important characteristic of the settlements in this group is availability of different categories of health facilities such as rural hospital, comprehensive health centre, clinic and dispensary. It was observed that, four of the settlements namely Gawu Babangida, Lemu, Nasko and Tunga Magajiya were provided with rural hospitals. The possible explanation for this may not be unconnected with the fact that Gawu Babangida, Lemu and

Nasko were headquarters of their respective local government areas, while Tunga Magajiya had the oldest hospital in the state initially established by the christian mission.
Other settlements namely Agwara, Gulu and Tegina in this group were equally provided with comprehensive health centres, clinics or dispensaries

Fig. 2: Type A Settlements



Source: Ministry of Lands and Housing Minna and Author's fieldwork 2011

In terms of provision of educational facilities, it was observed that all the seven settlements in this group were provided with secondary and primary schools. However, Tunga Magajiya stood out with three secondary schools and five primary schools probably due to the influence of the Christian mission. Nasko is the least with one primary school and two secondary schools.

Availability of water facilities such as public taps and boreholes is another important feature of the settlements in this group. It was observed that three of the settlements namely Gawu Babangida, Lemu and Tegina were provided with public taps through the Federal government Small Town Water Projects (STWP) executed by Bi-water Shellabear Company. It was also observed that all the settlements in this group were provided with public boreholes; however, Gawu Babangida was leading with about six motorized boreholes, while in Gulu only two boreholes were provided.

Provision of electricity is another significant characteristic of the settlements in this group. Consequently, it was observed that out of the seven settlements in this group, only Agwara was not connected to the National Grid for supply of electricity. It was further observed that among the settlements connected to the National Grid, there were some settlements that had no regular supply of electricity. A typical example was Gulu where residents claimed not to have enjoyed electricity supply for over one year due to vandalisation of the cables that connected their settlement to the National Grid from Abuja.

In terms of provision of road facilities, two settlements namely Agwara and Gulu were not provided adequately. It was also observed that these settlements were not provided with quality federal and state roads. For example, the state road that connected Gulu to Lapai which was under construction had been abandoned by the contractors thereby making the journey from Gulu to Lapai to be very difficult.

Other settlements in this group were provided with varied length of roads of different quality.

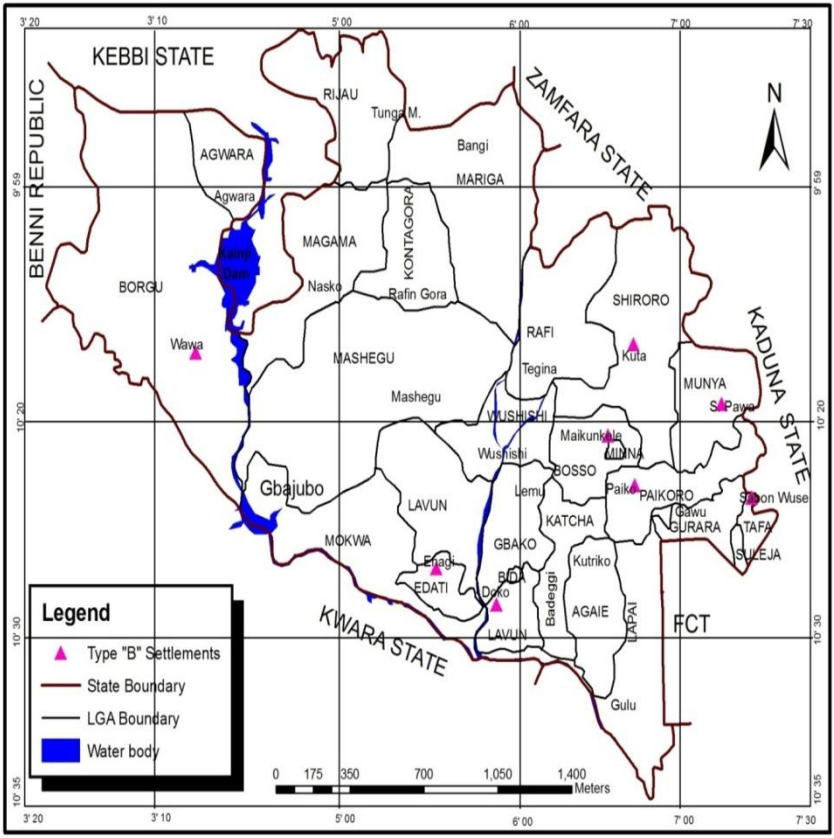
It is significant to note that four of the settlements, namely Agwara, Gawu Babangida, Lemu and Nasko were headquarters of Agwara, Gurara, Gbako and Magama local government areas respectively. It is therefore, not surprising that additional socio-economic facilities were provided in these settlements. These facilities include magistrate and sharia courts, police stations, commercial and micro-finance banks as well as communication facilities such as GSM masts. However, Gawu Babangida and Agwara were observed to have been provided with more socio-economic facilities than other settlements in this group. This may not be unconnected with the fact that these settlements were headquarters of their respective local government areas. For example, Gawu Babangida had a magistrate court, a sharia court, a police station, a commercial bank, a micro-finance bank and four GSM masts, while Agwara had a sharia court, a police station, a commercial bank, a micro-finance bank and a GSM mast. The least in terms of additional facilities is Tunga Magajiya with only a police station and a GSM mast. The possible explanation for this may not be unconnected with the fact that Tunga Magajiya was not the headquarters of the local government area and proximity to Rijau (i.e about 10km) which was the headquarters of the local government area having comparatively more socio-economic facilities.

Infrastructural characteristics of type B settlements

The group is made up of eight settlements namely Doko, Enagi, Kuta, Maikunkele, Paiko, Sabon Wuse, Sarkin Pawa and Wawa as shown in Table 1 and Figure 3. Provision of different categories of health facilities ranging from rural hospital, comprehensive health centre, clinic and dispensary is an important characteristic of the settlements in this group. It was observed that Kuta, Maikunkele, Sabon Wuse and Sarkin Pawa were provided with rural hospitals while Doko, Enagi and Wawa were provided with comprehensive health centres, clinics

and dispensaries. It was also observed that Kuta was provided with more health facilities than other settlements in the group with one rural hospital, one comprehensive health centre and two clinics.

Figure 3: Type B Settlements



Source: Ministry of Lands and Housing Minna

In terms of educational facilities, all the settlements in this group were provided with educational facilities such as secondary and primary schools. However, it was observed that the settlements of Kuta, Paiko and Doko had significant number of secondary and primary schools than other settlements in the group. This is expected considering the large population sizes of these settlements and the fact that Kuta and Paiko were headquarters of their respective local government areas while Doko was once the headquarters of the defunct Doko local government area. For example, it was observed that Kuta had the highest number of educational facilities with four secondary schools and eight primary schools. Other settlements in the group such as Enagi, Maikunkele, Sabon Wuse, Wawa and Sarkin Pawa were also provided with secondary and primary schools.

Availability of water facilities such as public tap and borehole is an important characteristic of settlements in this group. Some of the settlements that were leading in the provision of water facilities include Kuta, Paiko, Doko and Sabon Wuse. It was also observed that Kuta had the highest number of water facilities with twenty two public boreholes. Other settlements which include Maikunkele, Enagi, Sarkin Pawa and Wawa were also provided with public taps as well as public boreholes.

It is also important to note that all the settlements in this group were connected to the National Grid thereby making it possible for them to be supplied with electricity. However, it was observed that in terms of regular supply of electricity, Kuta and Sarkin Pawa were the leading settlements. This may not be unconnected with the proximity of these settlements to Shiroro hydro electric power generation plant.

Provision of different categories of roads namely federal, state and local government roads is a significant feature of the settlements in this group. However, it was observed that Paiko was leading in terms

of total length of road with, 4.94km of federal road, 7.53km of state road and about 3.40km of untarred roads within the settlement. The possible explanation may not be unconnected with the fact that the settlement is located along the main Minna-Suleija Road, its position as the headquarters of Paikoro local government area and its historical antecedent as one of the foremost Gbagyi settlements. Enagi appears to be the least in this group with 1.39km of federal road, 0.62km of state road and 1.11km of untarred township roads. The possible explanation for this may be attributed to the small population size of the settlement.

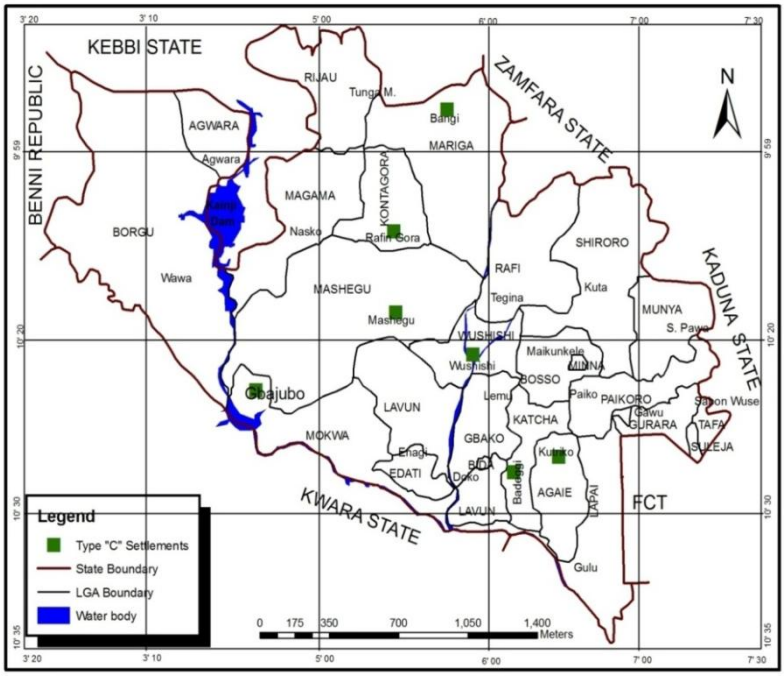
A significant observation about this group is that six out of eight of the settlements were headquarters of local government areas, a situation which made it possible for provision of additional socio-economic facilities such as magistrate and sharia courts, police stations and posts, commercial and micro-finance banks, and communication facilities (i.e GSM mast). It was however, observed that Paiko seems to be leading in the provision of these socio-economic facilities with a sharia court, a police station, a commercial bank, a micro-finance bank and ten GSM masts. This may be attributed to the fact that Paiko was the headquarters of the local government area. On the other hand, Wawa was identified to be the least with only a magistrate court, a police station and two GSM masts. The possible explanation for this may not be unconnected with the small population size of the settlement.

Infrastructural characteristics of type C settlements

This group comprises of seven settlements namely Baddegi, Bangi, Gbajibo, Kutiriko, Mashegu, Rafin Gora and Wushishi as shown in Table 1 and Figure 4. Provision of different categories of health facilities such as rural hospitals, comprehensive health centre, clinic and dispensary is a major feature of the settlements in this group. However, it was observed that Baddegi and Bangi stood out clearly in

terms of provision of health facilities. For example, Baddegi was provided with a rural hospital, a comprehensive health centre and a clinic while Bangi had a rural hospital, a comprehensive health centre and a dispensary. The strategic location of Baddegi along a major road and the fact that Bangi was the headquarters of local government area may be responsible for this. Gbajibo appears to be disadvantaged in the provision of health facilities with only one comprehensive health centre a situation which the residents claimed to be grossly inadequate. The remoteness of the settlement and its small population size may be responsible for this.

Fig. 4: Type C. Settlements



Source: Ministry of Lands and Housing Minna

Availability of educational facilities especially secondary and primary schools is also an important feature of the settlements in this group. It was, however, observed that generally all the settlements in this group were provided with educational facilities. However, Wushishi was leading with a secondary school and six primary schools. This can be attributed to the fact that the settlement was the headquarters of Wushishi local government area.
Provision of water facilities such as public taps and boreholes is an equally important characteristic of the settlements in this group. It was observed that the settlements in this group were not provided equally with water facilities. For example Mashegu had two boreholes, Gbajibo had one borehole while Rafin Gora also had one borehole.

Electricity provision is another important characteristic of the settlements in this group. However, it was observed that not all the settlements in this group were connected to the National Grid for supply of electricity. It was observed that Bangi and Mashegu were yet to be connected to the National Grid. Despite the fact that they were headquarters of Mariga and Mashegu local government areas respectively.

In terms of additional socio-economic facilities, it was observed that Bangi, Mashegu and Wushishi were provided with magistrate and sharia courts, police stations, commercial and micro-finance banks as well as GSM masts. The possible explanation for this may not be unconnected with the fact that these settlements were headquarters of their respective local government areas. It is however, significant to note that Baddegi, although not a local government headquarters was equally provided with additional socio-economic facilities due to its location along a federal road, the presence of National Centre for Cereal Research (NCCR) and its historical antecedent of being the location of the first water treatment plant which supplied the ancient town of Bida with potable water.

Infrastructural scores of the settlements

From the foregoing, three groups' settlements labelled A, B and C were produced by the hierarchical clustering technique based on availability of infrastructure. It was observed that although the quantity of infrastructure varied among the settlements, group B settlements consisting of Doko, Enagi, Kuta, Maikunkele, Paiko, Sabon Wuse, Sarkin Pawa and Wawa seem to have more infrastructure than group A and C settlements. Group A settlements consisting of Agwara, Gawu Babangida, Gulu, Lemu, Nasko, Tegina and Tunga Magajiya appear to have more provision of infrastructure compared to group C settlements. On the other hand, group C settlements consisting of Baddegi, Bangi, Gbajibo, Kutiriko, Mashegu, Rafin Gora and Wushishi appear to be the least in terms of provision of infrastructure. Settlements clustering with corresponding infrastructural scores are shown in Table 2. The study revealed that Type B settlements had a total infrastructural score of 687, while Type A settlements and Type C settlements had total of 316 and 307 infrastructural scores respectively. This scenario has implication for policy planning in the state and therefore necessitating deliberate efforts on the parts of state and local governments to provide more infrastructures in all the settlements identified to be disadvantage

Table 2: Settlements Clustering and Infrastructural Scores

Type A Settlements		Type B Settlements		Type C Settlements	
Settlement	Score	Settlement	Score	Settlement	Score
Agwara	53	Doko	102	Baddegi	79
Gawu Babangida	70	Enagi	53	Bangi	39
Gulu	38	Kuta	150	Gbajibo	18
Lemu	46	Maikunkele	85	Kutiriko	34
Nasko	29	Paiko	139	Mashegu	27
Tegina	42	Sabon Wuse	68	Rafin Gora	22
Tunga Magajiya	38	Sarkin Pawa	48	Wushishi	88
		Wawa	42		
Total	**316**	**Total**	**687**	**Total**	**307**

Source: Author's fieldwork, 2011.

Conclusion and recommendations

The study revealed that three groups of settlements labelled A, B and C was produced by the hierarchical clustering technique based on availability of infrastructure. It was observed that although the quantity of infrastructure varied among the settlements, group B settlements consisting of Doko, Enagi, Kuta, Maikunkele, Paiko, Sabon Wuse, Sarkin Pawa and Wawa seem to have more infrastructure than group A and C settlements. Group A settlements consisting of Agwara, Gawu Babangida, Gulu, Lemu, Nasko, Tegina and Tunga Magajiya appear to have more provision of infrastructure compared to group C settlements. On the other hand, group C settlements consisting of Baddegi, Bangi, Gbajibo, Kutiriko, Mashegu, Rafin Gora and Wushishi appear to be the least in terms of provision of infrastructure.

There is the need to sustain the Ward Development Projects which was introduced in 2008 by the Niger State government. The Ward Development Projects (WDPs) is a grass-root development initiative with monthly allocation of one million Naira (N1,000,000) to each of two hundred and seventy four (274) wards throughout the state. It is suggested that the monthly allocation to the wards be increased, while more community participation in project initiation, identification, monitoring, implementation and evaluation should be encouraged. It must be noted that the role of participation cannot be over emphasized in projects/programmes that affect the life of the people directly. It is therefore, advocated that the people or citizen should be involved and informed at every stage of infrastructure planning by the government or donor organizations.

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