

**CREATING A GEO-DATABASE FOR PRIMARY SCHOOLS FACILITIES IN  
KAURA LOCAL GOVERNMENT AREA, KADUNA STATE, NIGERIA**

**BY**

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**B.Sc. (ABU) 2008**

**M.Sc./SCIE/02297/2010-2011**

**A THESIS SUMMITTED TO THE SCHOOL OF POST GRADUATE STUDIES,  
AHMADU BELLO UNUIVERSITY, ZARIA**

**IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF  
MASTERS DEGREE IN GEOGRAPHIC INFORMATION SYSTEM AND  
REMOTE SENSING**

**DEPARTMENT OF GEOGRAHPY,  
FACULTY OF SCIENCE,  
AHMADU BELLO UNUIVERSITY, ZARIA NIGERIA.**

**May, 2015**

## DECLARATION

I declare that the study in this thesis entitled “*Creating a Geo-Database for Primary Schools in Kaura Local Government Area, Kaduna State, Nigeria*” was conducted by me, and has not been presented in the department or anywhere for a degree or publication. All sources of information and quotations are properly acknowledged.

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**Barnabas Aboshio, MUGU.**

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**Date**



## **DEDICATION**

This work is dedicated to God Almighty, the creator and giver of life and hope, my amiable parents Mr. Victor Bidi Mugu and Mrs. Justina Kubai Mugu and to the African child who is denied privilege to basic education.

## **ACKNOWLEDGEMENTS**

Oh Lord God almighty, thou art worthy to be praised and adored, I am grateful for your mercies and grace and for making this course a success, Thank you Lord Jesus.

My profound gratitude goes to my team of supervisors, Prof E. O. Iguisi and Dr. B. Akpu for their selfless commitment and sacrifices in making sure that this work is accomplished, I am really grateful. Special appreciation goes to my family for their understanding and support during the hectic days of this program, you are really wonderful.

I want to sincerely acknowledge my friends who supported me at different capacities during this program, God bless and keep you all.

To all my Lecturers and colleagues in Remote Sensing and GIS class of 2010/2011, I thank you all, for being part of this journey.

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## **ABSTRACT**

The aim of the study is to develop a Geo-Database for Primary Schools in Kaura Local Government Area, Kaduna State, Nigeria using Remote Sensing and Geographic Information Systems Technique. 104 UBE primary schools were identified with a population of 326137 people across the study area. All the schools in the study area were purposively sampled and used in the study. The attribute data were obtained through the administration of a checklist to the Head-Teachers of the schools. The coordinates of each school were obtained using a hand-held GPS receiver. An administrative map of the study area was obtained from the Local Government Area to derive the base map through digitizing process. The map was geo-referenced and digitized in ArcGIS 9.3. An overlay analysis was performed and all the coordinates of the UBE primary schools were displayed on the composite map. A GIS database was created where the spatial and attribute data were encoded and query analysis was carried out. The queries performed revealed 724 functional classrooms with 66% of the schools having less than six classrooms. The study also found 36% and 35% of the schools without toilet facilities and sources of drinking water respectively. While only 14% of the schools had playgrounds, there were no computer and internet facilities in any of them. The study recommends among others, provision of functional facilities by the Kaduna State Ministry of Education and the Local Government Area of study

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 BACKGROUND TO THE STUDY**

Education occupies a very unique position in the national development program of Nigeria. It is the bedrock of socio-economic and political advancement. Therefore, the right approach to achieving best results in the Education reform program is to have a good educational statistical data base (National Bureau of Statistics (NBS), 2005).

Studies have demonstrated that investment in elementary education amplifies the productivity in all the sectors of the economy much more than other levels of education and that economic return to investment in primary education are greater than those arising from other levels of schooling (Gouri, Pravat, and Soumen, 2012). Nigeria has come to appreciate the focal position of education as an instrument par excellence for achieving individual and societal development (Ajayi and Adeyemi, 2011). This is demonstrated in the provision of basic education as evident in the formulation of a National Policy on Education (Federal Republic of Nigeria (FRN), 2004).

Primary education as referred to in the National Policy on Education is the type of education given in institutions for children aged 6 to 12 years (FRN, 2004). It is the foundation level of the educational system which runs for six years, and it is aimed at developing basic literacy, numeracy, communication skills and transmission of the culture of the people to younger generations (Durosaro, 2004).

Primary education is pivotal to the attainment of the overall national educational goals and it is seen to be the key to the success or failure of the whole education system (Ogomaka, 2007). The National Policy on Education provides every child the right to tuition-free primary education (FRN, 2004). This has resulted in an increase in the school enrolment and in the number of educational institutions, particularly in the public sector. The 6-3-3-4 system introduced in 1981 provides six years of primary education, followed by three years of junior secondary education, and three years of senior secondary education. The last segment of four years is for university or polytechnic education. Subsequently, the National Literacy Program for Adults was launched, followed by the establishment of Nomadic Education to address the needs of children of migrant cattle herders and fishermen in the riverine areas (National Population Commission, 2008).

The UNESCO (2002), Adeyemi (2004), and Arikewuyo and Onanuga (2005) conceptualize Basic Education as all forms of organized education and training, including access to information to equip the individual to cope better with work and family responsibilities and change his/her image. The Universal Basic Education (UBE) system, launched in October 1999, made it compulsory for every child to be educated free of tuition up to the junior secondary school level in an effort to meet Nigeria's manpower requirements for national development (Osuji, 2004).

According to 2006 population and housing census, about 45% of the Nigerian population are within the age bracket of six to twelve years (NBS, 2007), which according to the provisions of National Policy on Education, is the corresponding age group for primary education (FRN, 2004). Denga (2000) noted that universal access to education has been the prime target for Nigeria, since the middle of the 1970s when the Universal Primary

Education (U.P.E.) scheme blasted off. This led to sharp increase in enrolment from 6.2 million in the 1975/76 academic session to 14.8 million in 1992. In 2008, there were 58,217 primary schools and 291,701 classrooms, with an enrolment of about 21.1 million pupils and 594,192 teachers in the nation's public primary schools (Universal Basic Education Commission (UBEC), 2008). This sharp increase in enrolment without adequate planning created problems (Denga, 2000). Obviously, the enrolment pattern in the educational system follows the pyramidal structure of the nation's population distribution. The primary level has the largest enrolment, followed by the secondary level and then the tertiary level. This enrolment structure, no doubt, depicts the structure of our social demand for the various levels of education (Durosaro, 2004).

Infrastructural provision is necessary for the overall physical and socio-economic development of any region and in maintaining and sustaining livable standards within the towns and villages (Olujimi, 2000). Educational facilities are also regarded as infrastructure (Olamiju and Olujimi, 2011). Educational infrastructure according to Adepoju and Fabiyi (2010), and Amnesty International (2012) refers to the basic structures and facilities necessary for education such as; school buildings, blackboards, tables, desks, chairs, laboratories, instructional materials, sanitation facilities, electricity, potable source of drinking water, recreational facilities and recreation grounds, libraries, computer facilities, first-aid kits, etc. These are expected to be provided for effective teaching – learning to take place, as well as for adequate classroom population, effective classroom climate, and standard pupil-teacher classroom ratio and pupils academic achievement to be attained among others. Ogunsaju (1980) and Asiabaka (2008) maintain that the quality of education that children receive bears direct relevance to the availability

or lack, of physical facilities and overall atmosphere in which learning takes place. According to the authors, these facilities play pivotal role in the actualization of educational goals and objectives by satisfying the physical and emotional needs of staff and students of the school.

Infrastructural facilities are vital resources that facilitate all-round development of man and his environment (Ayanwole and Inobeme, 2009), however, in many developing countries of Africa, these social facilities are unevenly distributed (Emmanuel, 2000). One of the most outstanding educational problems in Nigeria, as in other parts of the developing world, is the inadequate number of schools in various parts of the country especially in the northern part (UNICEF, 2005). This problem is aggravated by locational inequalities in the siting of the few available schools.

The inadequacy and uneven distribution of facilities may be ascribed to poor forecast of facilities needs of schools due to poor planning strategies arising from inadequate and poor statistics (Edun, 2005). Even when sufficient planning is put in place, government at all levels is usually not ready to bear the full financial demand of education (Ayanwole and Inobeme, 2009).

Empirical findings have shown that facilities are unequally distributed in our communities such that the vast majority of the people are caught in a never ending struggle to gain access to infrastructures in order to improve their quality of life (Eyles, 1996; Oyerinde, 2006). Inequalities in access to infrastructures can be as a result of inefficiency in the distribution and allocation of facilities between areas or as a result of social barriers like ethnicity, religion or status which may directly limit certain groups

from having access to public facilities (Stevenson, 2004). The spatial variation in availability and access to infrastructure results in spatial disparities in living standards both within and between regions and localities (Madu, 2007). Access to infrastructure inspires life and well-being and in turn breeds a sense of self-reliance, national pride and also aids the realization of full potentials and opportunities by the individual thereby, reducing inequalities among the citizenry (Oyebanji, 1978).

ESRI defines a geo-database as a physical store of geographic information inside a database management system (DBMS). Establishing a direct relationship between information and their geographical location is a unique characteristic of GIS, a versatile tool that also enables information to be displayed as maps. As a decision-support tool, GIS helps to integrate several data sets, and unravel complex relationships between phenomena within an ordered spatial framework (Akinyemi, 2001).

GIS helps in making the presentation of data more attractive than traditional static maps, and through considering geographical (spatial) factors, the analysis becomes “finer” and more precise, increasing the likelihood that ensuing strategies more pertinent. More flexible assistance can be provided in prospective planning at multiple levels or units of analysis: national, regional, provincial/district, and local (DeGrauwe, 2002), hence the need for the analysis of the spatial distribution and database creation for UBE primary education infrastructure in Kaura Local Government Area of Kaduna State.

## **1.2 STATEMENT OF THE RESEARCH PROBLEM**

One of the components of the Millennium Development Goals (MDGs) is achieving universal basic education for all boys and girls by the year 2015. The realization of this

goal will remain a dream as long as there is imbalance in the distribution of educational facilities (Olamiju and Olujimi, 2011).

Over the last decade, Nigeria's exponential growth in population has put immense pressure on the country's resources and on already overstretched public services and infrastructure. With children under 15 years of age accounting for about 45% of the country's population, the burden on education and other sectors has become overwhelming. Also, 40% of Nigerian children aged 6-12 do not attend any primary school with the Northern region recording the lowest school attendance rate in the country, particularly for girls (UNICEF, 2005). There is no doubt that primary school system in Nigeria is facing serious problems with the huge number of pupils it has to cater for. These problems culminate in acute shortage of infrastructural facilities, non-payment of teachers' salary and security problem, some primary schools have no enough classrooms and furniture to the extent that classes are held under shades of trees, some pupils carry-home their benches and desks and bring them to school every morning. The instructional materials needed to aid teaching-learning activities are not available (Olaniyan and Obadara, 2008). Demographic studies on the existing national situation in the primary education sector revealed that, 12% of primary school pupils sit on the floor, 38% classrooms have no ceilings, 87% classrooms overcrowded, while 77% pupils lack textbooks (Adepoju and Fabiyi, 2010).

The FGN/UNESCO/UNDP (2003), noted that, the management of primary education had been experiencing some problems as a result of policy gaps in Nigeria. Schools were not well-maintained and facilities were not adequately provided. Lack of accurate and timely data has long been the bane of policy formulation and management of our primary

education system in Nigeria (Udo and Chuks, 2010). To obtain accurate data on enrolment, teachers, non-teaching staff and even facilities appear to be a difficult task for the school managers. The school managers and teachers appear to lack adequate cognitive development in the areas of data collection, analysis and storage. Apart from this lack of capacity of the school managers, school data collection and analysis seem to be marred by other socio-politico- economic factors such as fraud, politics of national resource allocation and social apathy (Durosaro, 2004).

In Kaura Local Government Area, a major problem is the pattern of distribution of these basic primary education infrastructures which exhibits bias among the 10 wards in the area, hence school drop-out is at a higher level in some areas than others. This spatial variation in availability and access to infrastructure results in spatial disparities in living standards both within and between regions and localities (Madu, 2007). Little wonder, the adverse effect of this neglect on the national education system. Observable evidence shows that greater emphasis is placed on the development of school infrastructure in the more urban wards either directly or indirectly to the almost neglect of the remote areas. There is also a lack of coordination in the distribution of infrastructures to make them more relevant to the people they are meant to serve (Aderamo and Magaji, 2010). It was observed that infrastructural development is not taken seriously. This is because it is either taken for granted or it is difficult to quantify its direct and indirect effects. Also, it is either they are inadequately provided, or they are outright neglected (Umoren et al 2009).

Some scholars (Al-zeer, 2005; Emmanuel, 2000; Ayanwole and Inobeme 2009; Aliyu, Sule and Youngu 2011; Abbas, 2012) have carried out studies in other parts of the world

and in different parts of Nigeria, using different techniques and on different aspects which include facilities mapping and database management. For example, Al-zeer, (2005) analyzed the spatial distribution of public secondary girls' and boys' schools in Riyadh, Saudi Arabia using Geographic Information Systems. The results indicated a shortage of public secondary schools resulting in overcrowding in majority of government secondary schools.

Emmanuel, (2000) assessed the spatial distribution of social facilities in Taraba State. The author tested the veracity that population, distance and the number of taxable adults are significant determinants in the spatial distribution of social amenities in the area. The work subjected to simple regression analysis and the result obtained was that facilities are a direct function of population and the number of taxable adults and an indirect function of distance.

Similarly, Ayanwole and Inobeme (2009) assessed the spatial distribution of government secondary schools in Zaria area, Kaduna State using questionnaire survey method. Their findings revealed that there are only 23 Government owned secondary schools out of 61 secondary schools in Zaria area, with Zaria city having 30.43%, Sabon Gari 26.1%, and Palladan/Bassawa area 17.4%, Samaru, Wussasa/Gaskiya, and Kongo each has 8.7%, while Dakaci, Dogarawa and Tudun Wada areas had none. Their study argues that the uneven distribution of Government Owned Secondary education facilities, their inadequacy and inefficiency encourage the proliferation of Private Owned Secondary Schools (POSS) and has serious adverse effects on the quality of education.

Aliyu, Sule and Youngu (2011) assessed the effectiveness of MDGs target as it concerns the state of education in AMAC metropolis, Abuja. Their findings revealed that the closest distance between public schools to Area 1 and Wuse Central bus stop were 0.769 and 1.15 km respectively. The implication is that primary school pupils are forced to walk long distances to school and this affects their performance resulting in school drop-out. The study also showed that 21% of the schools have no library at all and that 36.84% of the schools in the districts have over crowded class rooms. This clearly shows that achieving universal basic education for all boys and girls by the year 2015 which is the second objective of the MDGs is not feasible.

Abbas (2012) undertook a study on Database Management and Mapping of Secondary Education Infrastructure in Sabon-Gari and Zaria Local Government areas, Kaduna State, Nigeria using GIS technique. The results revealed that 36% of the schools in the area had library, computer, chemistry, physics, and biology laboratories. The findings also showed that most of the secondary schools were concentrated in Sabon Gari while Kuregu and Ungwan Abashi had no secondary schools.

Although a number of studies (Al-zeer, 2005; Emmanuel, 2000; Ayanwole and Inobeme, 2009; Aliyu *et al*, 2011; Abbas, 2012) have been conducted on secondary schools mapping, and database management using GIS, none of these studies developed a geo-database for Primary Schools Facilities particularly in the study area. This is the gap in knowledge this study aims to address.

The study addressed the following research questions:

- i. Where are the primary schools located?

- ii. What is the pattern of distribution of the primary schools over the study area?
- iii. What are the available facilities in the primary schools?
- iv. What are the characteristics of the facilities?

### **1.3 AIM AND OBJECTIVES**

The aim of this research is to develop a Geo-Database which will assist in managing Primary Schools in Kaura Local Government Area, Kaduna State, Nigeria using Geographic Information Systems technique.

The specific objectives are to:

- i. identify and map the primary schools in the study area.
- ii. identify the available facilities in the primary schools
- iii. analyze the spatial distribution of the primary schools in the study area.
- iv. develop a geo-database for the primary schools in Kaura LGA.
- v. examine the characteristics of the primary education facilities.

### **1.4 JUSTIFICATION FOR THE STUDY**

The primary education level, being the bedrock of the child's basic education, is a very vital aspect of the nation's educational system that deserves to be handled with great care and caution. Any error committed in the organization and management of this level of education may reverberate on other levels and thus seriously mar the lives of the people and indeed the overall development of the nation. This is one good reason why all the stakeholders must show enough concern for those issues that concern the organizing and managing of our primary system (Durosaro, 2004). Therefore, to be able to take sound

decisions on the management of primary education in Nigeria, there is the need to ensure availability of accurate data on the system (FGN/UNESCO/UNDP, 2003). A GIS database provides a comprehensive framework and organization of spatial as well as non-spatial data.

A GIS database for UBE primary schools in Kaura LGA will be of great importance to the State and Federal Governments, Non- Governmental Organizations and the private sector in achieving national education objectives. With this database there is a potential for improved efficiency of schools through effective decision making in the planning and management of available resources and the display of geographic knowledge. Creating a geo-database will help to create equality of educational opportunities by leveling off of the existing disparities in the distribution of educational facilities. This research will make available a comprehensive database for efficient management of primary schools in Kaura Local Government Area.

### **1.5 SCOPE OF THE STUDY**

This research was restricted to Kaura Local Government area of Kaduna State. The spatial extent of the research covered Kagoro, Manchok, and Takad Chiefdoms which make up Kaura LGA. The content scope of the research covered the location, mapping, and generating of geo-database of the primary schools infrastructure in the study area. The study was limited to the consideration of data and information of primary schools infrastructure as at 2013.

## **CHAPTER TWO**

### **CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

In this Chapter, a review of recent studies related to the subject matter is presented. It begins with the concept of spatial distribution, concept of Universal Basic Education, the central place theory, spatial distribution of education infrastructure in Nigeria, education and national development, and the effects of the spatial distribution of education infrastructure.

#### **2.2 CONCEPTUAL AND THEORITICAL FRAMEWORK**

##### **2.2.1 The Concept of Spatial Distribution**

Public facilities or infrastructure such as schools, health centers, post offices, markets, police stations are generally not uniform in their spatial incidence and this is common in developing countries where apart from uneven population distribution, many other extraneous factors such as political consideration go into locational decisions (Aderamo and Aina, 2011). Unevenness as a general principle or concept can be seen to have occurred in several spheres of life and especially among natural phenomenon such as vegetation, soil and water bodies. Similarly, there exists unevenness in the distribution of social facilities (Enaks, 2011) such as primary schools.

The provision and spatial distribution of facilities has been of vital importance in both developed and developing countries. The need to provide facilities is for the purpose of

promoting and sustaining growth and development, increase in facilities satisfy basic needs and also sustain improvement in the quality of live (Mabogunje, 1990).

Access to infrastructure inspires life and well-being. This in turn breeds a sense of self-reliance, national pride and also aids the realization of full potentials and opportunities by the individual thereby reducing inequalities among the citizenry (Oyebanji, 1978). Inequalities exist between spatial units as they do between individuals (Anderson and Pomfret, 2004; Henderson, Shalizi and Venables, 2001; Kanbur and Venables, 2005). Inequalities in access to social infrastructures may also be as a result of inefficiency in the distribution and allocation of facilities between areas or as a result of social barriers like ethnicity, religion or status which may directly limit certain groups from having access to public facilities (Madu, 2007). Spatial inequality or inequality in accessibility to social infrastructures within the population of a society has existed since the dawn of civilization. The historical origins of social inequality are manifold, the caste systems for instance, developed in India and many examples of colonial occupation have resulted to racism towards indigenous Americans and Aborigines of Australia. Gross social inequality was epitomized in the South African system of apartheid. The social inequality was in form of segregation in which the European or colonial masters enjoyed infrastructural or public facilities while the indigenous areas were deprived of such facilities totally or partially (Hill, 1996).

Dickson *et al.*, (1996) have argued that provision points of facilities could be sufficiently explained according to central place theory with a regular hexagonal spatial pattern of provision at the lowest level, building up to a regular pattern of provision at each of the higher levels. Thus the type of standard which planners have developed to provide a

solution to these problems of inequalities owes a depth of gratitude to geographical theories of central place.

### **2.2.2 The Concept of Universal Basic Education**

The UNESCO (2002), Arikewuyo and Onanuga (2005) and Adeyemi (2007) conceptualize Basic Education as all forms of organized education and training, including access to information to equip the individual to cope better with work and family responsibilities and change his/her image. Also, the Jomtien Declaration and Framework of Action on Education for All (1990) defines Basic Education as a process which encourages close articulation of formal, non-formal and informal approaches to education and structures for the awakening of all round developments of human and capital potentials. Obayan (2000) describes basic education as that level, type and form of learning needed to build firm roots for literacy and numeracy, to inculcate basic life skills and more importantly, to consolidate the skills of learning how to learn.

The concept of Basic Education is not a completely new term to the Nigerian society and within the last decade, it has assumed a global significance and its meanings have been broadened. The expanded vision of UBE comprises the universalizing of access and promotion of equity, focusing on learning and enhancing the environment of learning and strengthening partnerships (Yoloye, 2004). The origin of Nigeria's educational policies dates back to the 1955 comprehensive education laws of the western Nigeria, 1957 Universal Primary Education (UPE) of the Eastern region and the 1976 UPE programme then, the baby programme in 2000 which is still been natured to maturity (Okugbe, 2009). The Universal Basic Education (UBE) system in Nigeria, launched in October

1999, made it compulsory for every child to be educated free of tuition up to the junior secondary school level in an effort to meet Nigeria's manpower requirements for national development (Osuji, 2004).

The UBE Vision Statement is that "At the end of 9 years of continuous education, every child through the system should be able to acquire appropriate level of literacy, numeracy, communication, manipulative and life skills and be employable, useful to himself and the society at large by possessing relevant ethical, moral and civic skills" (UBE, 2000). While the Mission Statement is to serve as a prime energizer of a rational movement for the actualization of the nation's UBE vision working in contact with all stakeholders thus, mobilizing the nation's creative energies to ensure that, Education For All (EFA) becomes the responsibility of all (UBE, 2000).

According to UBE (2000), the UBE vision and mission are to be achieved through the following objectives;

- a) Ensuring unaltered access to 9 years of formal basic education.
- b) Provision of free, universal education for every Nigerian child of school going age.
- c) Reducing drastically the incidence of dropout from the formal school system through improved relevance, quality and efficiency.
- d) Ensuring the acquisition of appropriate levels of literacy, numeracy, manipulation, communication and life skills as well as the ethical, moral and civic values needful for laying a solid foundation form lifelong learning.

### **2.2.3. The Central Place Theory**

Central place theory was first used by a German geographer, Walter Christaller in 1933 to explain how urban settlements evolve and are spaced out in relation to each other. The model in central place theory is explained using geometric shapes, such as hexagons and triangles. The locations are assumed to be located in a Euclidean, isotropic plane with similar purchasing power in all directions. A central place is a settlement or a nodal point that serves the area around with goods and services. Christaller's model was also based on the premise that all goods and services were purchased by consumers from the nearest central place, that the demands placed on all central places in the plain were similar and that none of the central places made any excessive profit (Agarwal, 2001).

The theory consisted of the basic concepts of centrality, threshold of population, range of a good and the principle of least effort. 'Centrality' is the draw to a particular place. The 'threshold' is the minimum market that is needed to bring a new firm or service provider or city into existence and keep it running and the 'range' is the average minimum distance that people will travel to buy these services or goods. Different goods and services have different population threshold and range. The principle of least effort on the other hand, indicates that people generally travel to the nearest location where a good or service is obtainable. This is the marketing principle in Christaller's model (Aderamo and Aina, 2011).

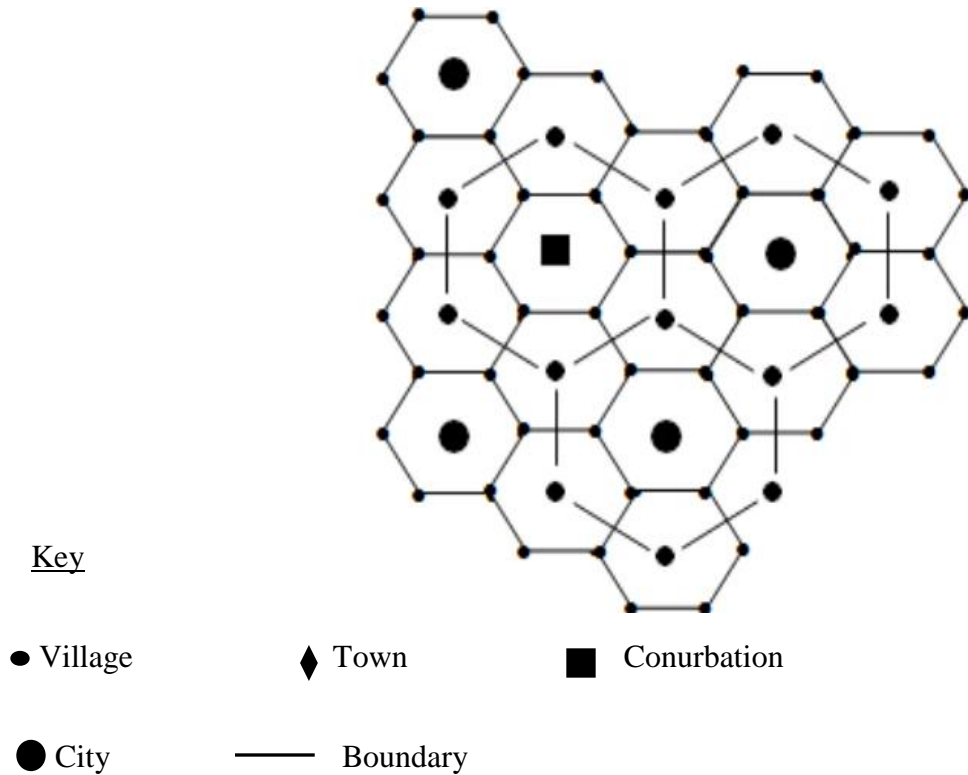
The marketing principle is better known as the  $K = 3$  system, where a hexagonal space is envisaged with the central places serving two lower-order places each or one-third of the lower-order places each or one-third of the lower-order neighbors surrounding them. So,

including the central place itself, a total of three places are served. The goal in the marketing principle was to serve a maximum number of consumers from a minimum number of centers. The hierarchy in the marketing model follows the rule of 3s (1, 3, 9, 27, 81, ...) where a consumer equidistant from three higher order places A1, A2, and A3 would purchase 1/3 from A1, 1/3 from A2 and 1/3 from A3 (Aderamo and Aina, 2011).

In the transportation model, the goal was to minimize the network length and maximize the connectivity of centers being served. To minimize transportation costs, a different model of  $K=4$  is proposed, where the hexagon is shifted so that the settlements are located at the center point of each side, and each central place serves a half-share of the surrounding hexagon, thus, the number of places served is four. In the administrative model, the goal was to provide a hierarchy of controls where the lower level centers are completely controlled or administered by the higher order places. The administrative model is where  $K=7$  and all the six lower-order places in the hexagon are served by the central place. Christaller envisaged these models as hierarchical, with all higher order places in the hexagon surrounded by other higher-order places to explain not only local but regional economics and specialization of urban centres (Agarwal, 2001).

Central Place Theory (CPT) has been extended and modified by scholars. For instance Losch (1938) proposed a consumer model based on administrative and manufacturing structure as opposed to service centres in Christaller's model. The model produced wedges of city-rich and city-poor areas spread out around a major central place, (see Figure 2.1). Also, Heibrun (1987) has argued that the Central Place Theory has acted as a foundation for a large body of work on "Systems of Cities". The best analogy has been made to the planetary system, where individual units are kept in place by gravitational

forces between them. The Central Place Theory attempts to show that each urban settlement is held in place within a system of cities and any changes in these are determined by a place's position within the system (Heilbrun, 1987; Abiodun, 1967).



**Fig. 2.1: Central Place Theory**

Source: (Agarwal, 2001).

In this study, an attempt is made to establish the central theory as a basis for the location of primary schools in the study area as the schools cannot be sited just anywhere even though they are public facilities. Resources cannot be wasted through duplicating of similar projects in virtually every locality where a single facility can suffice. In a similar manner, a primary school may be considered as a service center. It would therefore have identifiable catchment areas. Consequently, schools of different grades and standards would have different size catchment areas.

The principle of the range of a good and least effort are relevant in this study. Children are more likely to patronize primary schools close to them because of the higher cost of travelling to a distant facility. This is very true even for areas with low income levels. It is in view of this that the UNESCO (1991) stipulated that primary schools should be located within 500 meters to 1 km and about 10 minutes walking distance from their residence/settlement.

The second principle of central place theory is the threshold of a good. It is pertinent to note that for any good or service, there is a minimum demand or size of market necessary for a profitable sale of the good. This is because, below such a minimum demand level, the business will run at a loss, due to low number of customers. This minimum demand or size of customers is called the threshold.

It is important to state here that primary education is essentially a social service rather than a commercial service. In view of this, the satisfaction of the greater majority should be paramount, even though resources should not be necessarily wasted in providing schools everywhere.

## **2.3. REVIEW OF RELATED LITERATURE**

### **2.3.1. Spatial Distribution of Education Infrastructure in Nigeria**

Infrastructural provision is a necessary part of the overall physical and socio-economic development of any region. They are not only essential to overall economic growth, but they are important in maintaining and sustaining livable standards within the towns and villages (Olujimi, 2000). Development of education depends on large number of factors including the infrastructural resources available to a school. School infrastructure, such as

the site, buildings, furniture and equipment contribute to the learning environment (Ayeni and Adelabu, 2012). According to Ariyo and Jerome (2004), the adequate supply of infrastructure services has long been viewed as essential for economic development and poverty reduction, both in the policy and academic realms.

In spite of this universally acknowledged attributes and importance, Sub Saharan Africa (SSA) trails behind other regions in infrastructure service delivery and quality, with the gap widening over time. In spite of the immense contribution of education to the entire economy, the condition of educational infrastructures in Nigeria is very pathetic. This situation is clearly captured by UNICEF (2005) that despite political commitment to trying to reverse years of neglect in the education sector and a significant increase of the Federal funding, investment in basic education is still low compared to other Sub-Saharan countries.

Aderamo and Aina (2011), in their study on the spatial inequalities in accessibility to social amenities in developing countries, using Nigeria as a case study concluded that public facilities such as schools, health centers, post offices, markets and police stations are generally not uniform in their spatial incidence. This is common in developing countries where apart from uneven population distribution, many other extraneous factors such as political consideration go into locational decisions. From their study, the distribution of primary schools in Ifelodun LGA of Kwara State showed that some districts with a high population figures were having only a few primary schools.

Also, Akpan and Njoku (2013) identified the educational facilities in Ikot Ekpene LGA including their geometric properties and created a GIS database for both the public and

private schools in the study area. The authors observed that spatial location of schools in the LGA is uneven and almost randomly distributed such that some wards were essentially educationally deprived making children to trek long distances to schools. In another study, Olamiju and Olujimi, (2011) analyzed the locations of public educational facilities in Akure, Nigeria. They found out that population figures were not considered in allocation of educational facilities in the region. This trend shows that there is no equitable distribution of educational facilities in Akure area. Ibrahim (2009) studied the spatial analysis of the distribution of social facilities in Sabon Gari LGA, Kaduna State, and found out that there is an uneven distribution of social facilities in Sabon Gari LGA of Kaduna State.

Aliyu *et al*, (2011) applied Geospatial Information System to assess the effectiveness of MDGs targets in AMAC Metropolis, Abuja. They observed that the closest distance from public schools to Area 1 and Wuse Central bus-stops, are 0.769 and 1.15 km, respectively. This exceeds the stipulated standard by UNESCO (1991) that primary schools should be located within 500m-1km and 10 minutes walking distance from residents/settlements. Similarly, Duze (2010) discovered in a study on the average distance travelled to school by students in primary and secondary schools in Anambra, Enugu, and Ebonyi States and its effect on attendance that only 34.68% of all the primary schools investigated had pupils travelling less than one kilometer to school every day, while many pupils walk for more than 5km to school. The study therefore concluded that majority of these children travelled more than the stipulated one kilometer maximum for primary schools, indicating that many schools were located far away from children's homes, and this affected attendance adversely and is responsible for the high reports of

drop-out in these areas. This is an indication of gross unevenness and inequality in the spread of schools in Anambra, Enugu, and Ebonyi States.

Findings such as those of Al-zeer (2005), Akpan and Njoku (2013), Olamiju and Olujimi, (2011), Aderamo and Aina, (2011) among others, have shown that educational infrastructures are unevenly distributed within a region such that the vast majority of the people struggle to gain access to infrastructures in order to improve their quality of live. According to Abbas (2009), issues of centrality, location and accessibility have a vital role to play in the utilization of education infrastructure by the people. However, Green *et al.* (2008) stressed that achieving equitability is possible only if the areas that are under or overprovided are identified and corrective action is applied through appropriate planning and implementation. Determining the spatial mismatch between supply and demand is established by: deciding on suitable standards pertinent to a specific facility, which will be related to the demand (the population who will use the facility); acceptable travel costs (time or distance) to the facility and the capacity of existing facilities (based on size and functionality), (Green *et al.*, 2008).

### **2.3.2. Education and National Development**

Psacharopoulos and Woodhall (1985) defined national development as the improvement of a country's productive capacity through changes in social attitude, values and behaviour and finally, changes toward social and political equality and eradication of poverty. Gouri, *et al* (2012) sees education as a decisive determinant of economic and social expansion, and also household livelihoods and food security status and that studies have demonstrated that investment in elementary education amplifies the productivity in

all the sectors of the economy much more than other levels of education and that economic return to investment in primary education are greater than those arising from other levels of schooling. Education according to Obanya, (2002), has essentially been a social process in capacity building and maintenance of society since the creation of human beings. To cope with the changing realities and uncertainties of human life, education has been a weapon with which to equip the people to acquire relevant knowledge, skills and habits for surviving in the modern world.

Earlier studies Longe, (1999), Fabunmi and Akinwumiju, (2002), and Fabunmi, (2004) revealed a strong and positive relationship between investment in education and national development. Olamiju and Olujimi (2011) opined that if UBE will contribute meaningfully to our educational development, teachers have to be creative, innovative and inspiring, teaching materials should be adequate and well utilized; facilities such as school buildings, desks, tables, chairs, water, electricity, library and access roads need to be made available.

Education has been shown to have an impact on individual workforce outcomes such as a higher income, but the impact is greater when literacy and formal schooling are linked with reduced fertility rates, improved health and sanitation practices and an increased ability to access information and participate in various social and economic processes. Educated parents also tend to invest more in children schooling, health/nutrition, and human capital measures important for future well-being (UNESCO IIEP, 2002). Aliyu *et al* (2011) rightly observed that no society has ever achieved significant human development for its citizens without substantial and steady investment in education. Further more, it has been found that social infrastructure such as education, health, and

housing are essential to promote better utilization of physical infrastructure and human resources, thereby leading to higher economic growth and improving quality of life (Hall and Jones, 1999)

### **2.3.3 Effects of Spatial Distribution of Education Infrastructure**

Differences in access to education result in part from the social and economic mechanisms that create societal as well as territorial differences (Hampl, 2005). Educational provision is typically concentrated in settlement centers within the higher levels of the settlement hierarchy (Kučerová and Kučera, 2012). According to Fai, (2011), the low rate of enrolment or patronage pattern in public schools in Nigeria could be attributed to several factors including distance, location and type of facilities available in the schools. These factors are not peculiar to educational facility location alone, as demonstrated that attendance at each medical center in Ife region is a function of both type of service available there and the distance from other centers providing similar services.

With respect to average walking radius to a school in these districts, Idofian ranks first with a school serving areas within an average walking distance of 3.8km. This was followed by Omupo with a school serving areas within an average walking distance of 3.7km. Igbaja ranks third while Ora rank fourth. The other districts by ranks are Share, Oro-Ago, Ileere, Oke-Ode and Agunjin which rank fifth, sixth, seventh, eighth and ninth in that order.

A distance of one kilometer to school on foot is considered by school head teachers to be too long for children between the ages of six and seventeen. If students walk over one

kilometer to school, the outcomes would not be in the best interest of both the child and the school because set goals and objectives may not be truly achieved and distance travelled to school has some measure of relationship to ills like absenteeism, delinquency, truancy, lateness, indiscipline, and non-attendance to school. These ills, either singly or combined ultimately affect achievement at school (Arubayi, 2005). Also, when the distance travelled to school is too far for the child, besides fatigue, there is the tendency for the child to lose interest at school and begin to be truant, and may drop out of school completely (Duze, 2005).

Again, there are schools that are over-populated because of their location, and these are not without their peculiar problems associated with over-crowding in classrooms, inadequate provision of services, staff, and infrastructures, and poor attendance by pupils due to lack of seating places (Duze, 2005). Duze (2010), in a study on average distance travelled to school by primary and secondary school students in Nigeria and its effect on attendance, found out that distance covered by pupils in getting to school every day had substantial effect on school attendance. While a total average of 13.47% of primary schools investigated indicated no effect on school attendance by distance travelled, 86.53% were affected at various extents. The study also revealed that in Anambra and Ebonyi States primary school pupils are travelled for long distances to school.

Statistics in Nigeria today, show that more than fifty percent of primary school pupils and thirty percent of secondary school students, drop out of school yearly, and this is worse in some eastern states. It has also been observed that cases abound where children travel up to five kilometers to school on foot (Duze, 2005).

Abbas (2012) created a database and mapped the secondary education infrastructure in Sabon-Gari and Zaria Local Government areas, Kaduna State, Nigeria using GIS technique. The study observed that 64% of the schools did not have library, computer, chemistry, physics, and biology laboratories. The study also performed a buffer of 2km around the schools which shows that most of the schools were within a distance of 2km from residential areas while Kuregu, Ungwan Abashi and Zabi Zaria did not have schools close to them so the students had to travel more than 2km to the nearest school to them.

Arubayi (2005) compared distance travelled to school by pupils/students in Edo and Delta States and the effect on attendance. The findings revealed that a good number of primary and secondary schools in both Edo and Delta States were located far away from the residences of the pupils/students and this had some effect on school attendance. Also, research evidence showed that long distances travelled to school are among the major reasons for high dropout rates in primary and secondary schools in Nigeria and the South Eastern States of Nigeria have been observed as recording large numbers of school dropouts (Arubayi, 2005, Duze 2005 and Madumere, 1991). Therefore, when a public facility such as the educational facility is unevenly distributed in a region, there is every tendency that such facility to be underutilized or otherwise, and the people to be serviced becomes disadvantaged in the use of such facility (Olamiju and Olujimi, 2011)

## **CHAPTER THREE**

### **STUDY AREA AND METHODOLOGY**

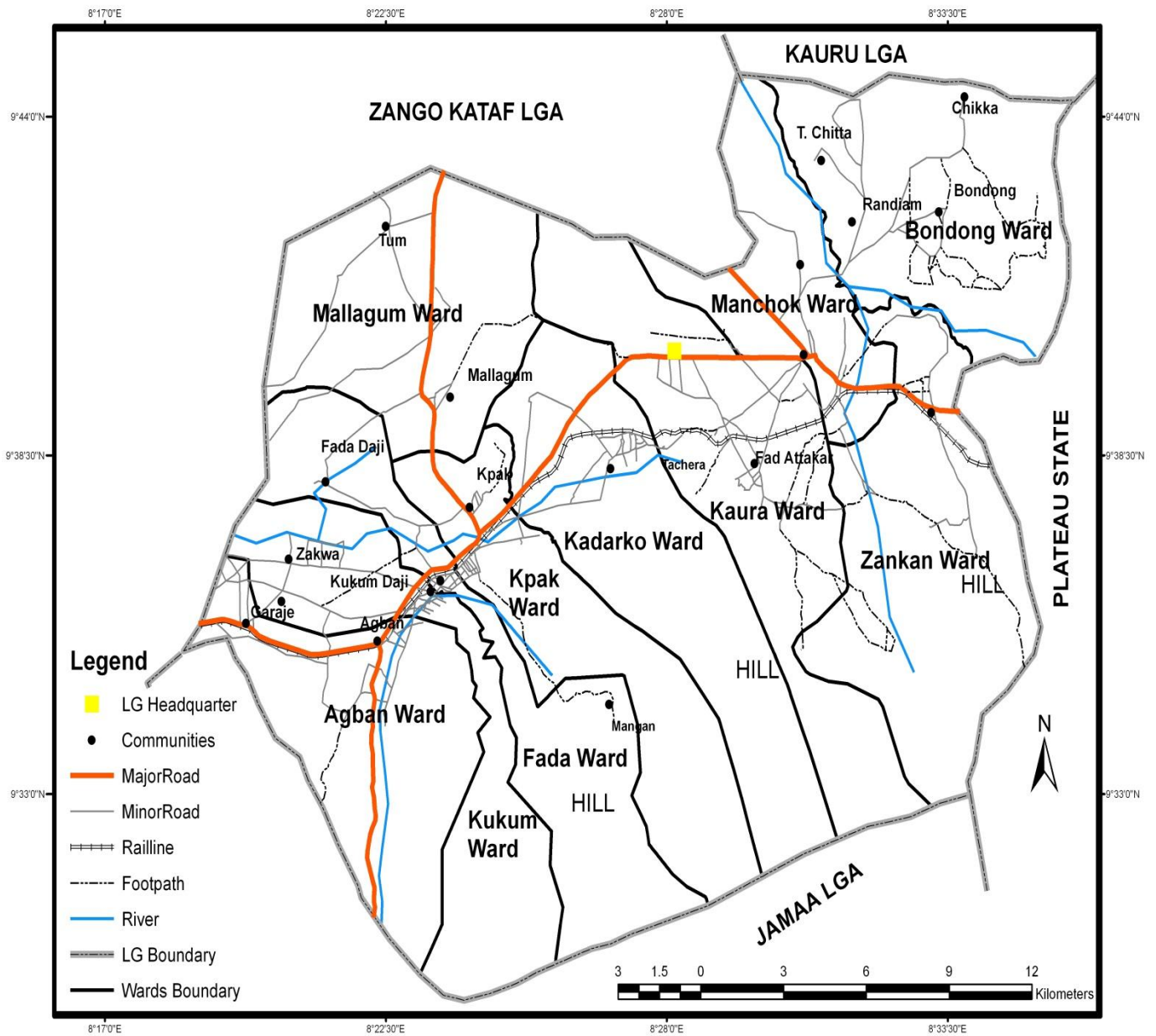
#### **3.1 INTRODUCTION**

This chapter gives a general overview of the study area and the methodological approach used to collect data, as well as the procedures used to analyzed data in order to achieve the set objectives of the study.

#### **3.2 THE STUDY AREA**

##### **3.2.1 Location**

Kaura Local Government Area lies between latitudes 9° 30' N and 9° 45' N and longitudes 8° 20' E and 8° 35' E. Kaura Local Government Area has an estimated landmass of 485 km<sup>2</sup>. This land area is bounded to the south by Jama'a L.G.A., Zango Kataf L.G.A. to the north, Kauru L.G.A. to the northeast, and to the east by Riyom L.G.A. in Plateau State. The Local Government Area is subdivided into ten wards for administrative purpose. These are Agban, kukum, Fada, Kpak, Mallagum, Kadarko, Kaura, Manchock, Bondong aand Zankan wards. See Figure 3.1



**Figure 3.1: Kaura Local Government Area.**

**Source: Modified from Administrative Map of Kaura LGA**

### 3.2.2 Soil and Vegetation

The predominant soil parent materials within the area are derived from pre-Cambrian granite gneisses and magmatites of the basement complex but these have been modified by weathering and are frequently overlain by gravel materials probably eroded from further upslope. In other places lateritic iron pan probably formed in late tertiary times and associated concretionary gravels overlie the insitu rocks. In some parts of the area, there are localized deep accumulations of unconsolidated materials which are probably due to mass movement. The surface horizons of many of the soils are sandy which could be explained by biological re-working in materials brought up from the weathering zone by termites and other soil fauna. Due to the marked seasonal rainfall the water table fluctuates and the sandy surface horizon of many of the soils drain rapidly particularly where it is underlain by gravel material (Hill *et al*, 1975).

The study area is situated in the tropics within the Guinea Savannah region. Savanna here is defined as vegetation in which perennial helophytic grasses of at least 80mm high with flat basal and cauline leaves play an important role. Although most of the grasses form tussocks, isolated from one another when fully grown form a more or less continuous layer dominating any lower stratum (Isa, 1956).

The vegetation consists of broad-leaved savannah woodland and when properly developed, the trees may attain heights of 10-15 m. relatively denser gallery forest occurs along some streams. The dominant trees within are *Isobertina doka* while *Khaya senegalensis*, *Danielia oliveri*, *Perkia* and *Ficus sycomotus* are common. There are abundant grasses with annual types dominating the uplands while the perennial type such

as *Hyparrhenia spp* and *Andropogon spp* are also common. Sugarcane and other garden crops, mostly vegetable, are cultivated along streams courses. The perennial streams in the area sustain such cultivation in the dry seasons via shadoof irrigation systems. Dominant food crops found in the area include root crops e.g. yams and cassava while stem tubers include potatoes. These are sometime intercropped with millet and maize (Yanet, 2012).

### **3.2.3 Relief, Drainage and Geology**

The relief is composed of undulating highlands to average height of about 1,800 m above sea level in the study area. There are two major rivers in the area. These are River Kaduna at the NE of study area and River Assob at the SE. Most of the streams are seasonal. The course of these rivers seems to suggest features of structural significance, aided by fractures normal to direction of regional strike and drains to River Kaduna with its tributary at the north-eastern part of the study area (Yanet, 2012).

The study area lies within the crystalline hydrogeological province of northern Nigeria belonging to the Younger Granite and Basement Complex suites. These rocks lack primary porosity where groundwater could accumulate for exploitation. For these rocks to store water, therefore there must exist in them secondary porosity, which invariably results from weathering and fracturing.

### **3.2.4 Climate**

Rainfall is seasonal and moderate with a mean annual amount of 1524 mm. Rainfall usually commences in March and ends in October and for the rest of the year dry season prevails. Temperatures vary between less than 15°C around December/ January and 32°C

in March and April with its annual mean between 24°C and 28°C. The relative humidity varies with the season with highest values in the rainy season and lowest values during the harmattan. The mean annual relative humidity is 57% (Yanet, 2012).

### **3.2.5 Population and Economic Activities**

The Local Government Area was created on 29th of May, 1989 by the defunct General Ibrahim Badamosi Babangida's administration, It was carved out of the then Jama'a Local Government Area. The administrative headquarter is located at Kaura, a town situated between Kagoro and Manchok. The 2006 National population and housing census put the population of Kaura LGA at 222,579 people with 115,369 males and 107,210 females. The population is spread over the entire wards of Local Government Area with a 2.5 percentage of growth rate (National Population Commission Gazette, 2007).

Subsistence agriculture is the major occupation of the inhabitants. Farm produce include; millet, rice, guinea corn, yam, cocoyam, potatoes, cassava, hungry rice, tomatoes, pepper, groundnut, sugarcane, ginger, maize, etc. Fruits available are; mango, orange, banana, grape, pea, pawpaw, date palm, palm fruits, etc., these produce serve as cash crops to the inhabitants. Rearing of livestock, such as goats, pigs, dogs, cattle, chicken, etc. is also carried out on subsistence level.

Commercial facilities available in the area include two major markets which are operated on a weekly basis. The Kagoro market which is operated on Saturdays and the Manchok market operated on Fridays. The area is traversed by good roads network which are the Jos –Kagoro Kaduna road that runs East-West. Others are the Kagoro-Kafanchan road,

Kagoro –Manchok Jos road and Kagoro- Mabushi road Manchok-Jankasa Mabushi roads. In the central part of the .study area, Rail line traverses from Kafanchan-Kagoro to Jos Terminus in Plateau State (Yanet, 2012)

### **3.2.6 Educational Facilities**

The Local Government Area has 3 tertiary intitutions out of which one is owned by the government while the other two are owned by private institutions. These are the National College of Statistics, Manchok; ECWA Theological Institute, Kagoro and ECWA College of Health Technology, Kagoro. There are a total of 12 Government Secondary schools, 7 private secondary schools and 104 public primary schools distributed around the Local Government Area (Authors Field Survey, 2013)

## **3.3 METHODOLOGY**

### **3.3.1 Preparatory Stage and Reconnaissance Survey**

At the preparation stage, the researcher acquired and installed appropriate software packages such as ArcGIS 9.3 and other support packages as well as relevant maps of the study area. The acquisition of a Geographic positioning System device, the assemblage and review of the relevant literature materials; visitation to a number of related establishments and organisations for the generation of attribute datasets, and funding for this research work was equally done at this stage. Also, Contacts were made with some experts and professionals in the field of study for the purpose of gathering relevant literature materials.

A reconnaissance survey of the study area was carried out to have an adequate knowledge of the study area. This was embarked upon to pave the way for a detailed field survey. During the survey, the researcher had discussions with the primary education secretary and other officials at the various primary schools within the study area and was informed that there are 104 primary schools across the study area.

### **3.3.2 Types of Data**

In order to achieve the set objectives of this study, the data required for this research are as follows:

- i. List showing the names of all the UBE primary schools and their addresses in the study area was acquired from the local government education secretariat, to be used to identify the schools for mapping.
- ii. Coordinates of each UBE primary school were obtained using the Garmin 76C5X Handheld GPS Receiver, which were overlaid on the map of the study area.
- iii. Attribute data which include; schools names, addresses of school, years of establishments, numbers of teachers, numbers of male and female students in each class, numbers of classrooms in each school, sourcees of drinking water, numbers of toilets, library and computer facilities, numbers of security personals, numbers of nannies, numbers of cleaners, schools code numbers, qualifications of staff, etc by interviewing the Headmaster/Headmistress in each primary school in the study area, and the attributes were used to develop the database.

- iv. The administrative boundary map of Kaura LGA was acquired from Department of Works at the Local Government Secretariat. This was digitized to display the spatial distribution of the schools
- v. Existing literatures from journals, textbooks, conference proceedings, seminar papers, theses, reports and web references.

### **3.3.3. Sources of Data Required**

Data for this study were collected from primary and secondary sources.

#### **3.3.3.1 Primary Sources of Data**

- GPS Survey: This was used to acquire coordinates of each primary school.
- Interview: This procedure was used to take a complete inventory of the existing UBE education infrastructures and their characteristics in the study area. An inventory check list was designed and used to identify and take records of the attributes of these infrastructures. The essence of the interview was to seek for primary information on the condition of the infrastructures available.

#### **3.3.3.2. Secondary Sources of Data**

- List showing the names of all the UBE primary schools and their addresses in the study area was acquired from the local government education secretariat.
- The administrative boundary map of Kaura LGA was acquired from Department of Works at the Local Government Secretariat.
- Existing literatures were sourced from journals, textbooks, conference proceedings, seminar papers, theses, reports and web references.

### **3.3.4 Data Collection Procedure**

The study involved fieldwork in which the schools were visited and their geographic coordinates were captured using the Garmin 76C5X Handheld GPS Receiver with an accuracy of 3-5 meters, the locations were picked and stored in the GPS.

Field survey was also carried out to conduct an interview using a prepared checklist to collect attribute data of the schools.

Secondary data were also obtained from different journals, past projects and theses, and the internet.

### **3.3.5 Techniques of Data Processing**

The study acquired a comprehensive list showing the names of all the UBE primary schools and their addresses in the study area. This was then copied in Microsoft excel and saved as CSV (comma delimited) format which is recognizable and acceptable to the ArcCatalog extension of ArcGIS. The coordinates of the schools obtained using the Garmin 76C5X Handheld GPS Receiver as well as the attributes of the schools acquired during the interview, were typed in Microsoft excel and saved as CSV (comma delimited) format which is recognizable and acceptable to the ArcCatalog extension of ArcGIS.

The administrative boundary map of the study area was scanned and imported into ArcGIS 9.3 for geo-referencing. The map was then converted to Universal Transverse Mercator (UTM) projection system with World Geodetic System (WGS) 84, 32N Minna datum, for easy distance measurement. Onscreen digitization was done with features such as roads, river, and rail-track in the study area digitized as line features.

### 3.3.6 Sample Size

The study area consists of 10 wards namely: Agban, kukum, Fada, Kpak, Mallagum, Kadarko, Kaura, Manchock, Bondong aand Zankan wards. For the purpose of this study, the 10 wards were purposively sampled and surveyed. The total population of Kaura L.G.A was estimated according to the 2006 census as 222 579 people (NBS, 2007). However, the 2006 population figures of the Local government area were not disaggregated into the 10 wards. Hence, the 1991 National population and housing census results which were disaggregated into localities were used and wards population figures were projected to 2014 in order to find the proportion of people in the respective wards to the infrastructures available. This is due to the non-availability of population figures for the localities and the school going age group in the 2006 population census results. Also, the entire population figures for the wards were used because according to NBS, (2007), from the 2006 population and housing census, about 45% of the Nigerian population is within the age bracket of six to twelve years.

The projection is based on the average population growth rate of Kaduna State that is 3%, using the formula:

$$P_{t+n} = P_t \times e^{r \cdot n}$$

Where:  $P_{t+n}$  = Future population

$P_t$  = Base year population

$e$  = Exponential

$r$  = Rate of population growth, and

$n$  = Time interval between future population and base year population (2014-1991=23). Table 3.1 displays the districts and their respective population figures.

**Table 3.1: Population Distribution and Sampled Size by Districts**

<b>Wards</b>	<b>1991 Population</b>	<b>2014 Projections</b>
Agban	17501	34892
Kukum	21715	43293
Fada	28240	56302
Kpak	33254	66298
Mallagum	7097	14149
Kadarko	9111	18165
Kaura	10540	21014
Manchok	15838	31576
Bondong	14940	29786
Zankan	5348	10662
<b>Total</b>	<b>163584</b>	<b>326137</b>

**Source: Adopted from NPC, 1991.**

### **3.3.7 Data Analysis**

A combination of descriptive and overlay analysis was employed in the analysis of the data. The descriptive statistics such as appropriate maps/diagrams and tables were employed to illustrate the distribution of the available infrastructures in the study area.

To identify and map primary schools and their available facilities in the study area, the name and address of each school was used to identify each primary school in the study area. With the aid of Garmin 76C5X Handheld GPS Receiver, the actual coordinates of each school was captured. The coordinates and other attributes of the schools were copied to Microsoft excel and saved as CSV (comma delimited) format, and then imported into ArcGIS 9.3 using the add XY, Command at the tools menu. This overlaid the points (coordinates) on the geo-referenced administrative map of the study area.

To analyze the spatial distribution of primary schools in the study area, the location of each school was used to determine general spatial distribution of schools within the administrative wards in the study area. This was done by overlaying the coordinates of

the schools on the base map of the study area. This process is referred to as a point on polygon overlay. The digitized features were overlaid with the schools coordinates to form composite maps showing the primary schools. Also population figures of the wards were used in order to find the proportion of people in the respective wards to the infrastructures available.

To develop a geo-database for the primary schools in the study area, the following data were collected and used in the development of the database.

- i. The study area map
- ii. List showing Primary schools names and addresses
- iii. Coordinates of Primary Schools.

All the necessary attributes for each Primary school was entered into its layer's/theme's attribute table. This was done by adding required number of fields (columns) to the table and entering the data for all the Primary school in their corresponding records (rows). Attributes collected included; school name, address of school, year of establishment, number of teachers, number of male and female students in each class, number of classrooms in each school, source of drinking water, number of toilets, library and computer facilities, number of toilets, number of security personals, source of drinking water, number of nannies, number of cleaners, school code number, qualification of staff

The coordinates and attributes of the UBE Primary school were copied to Microsoft Excel and saved as CSV (comma delimited) format which is recognizable and accepted by the ArcCatalog extension of ArcGIS. This file was later imported into Arc Map

environment using the add XY, Command at the tools menu. The system can be updated to reflect changes in any school attributes as well as appending more attributes in ArcGIS interface by an authorized ArcGIS application user.

To assess the characteristics of the primary education infrastructure, queries were carried out on the database using the query builder to assess the characteristics of some of these available infrastructures in the schools. The queries performed were: Select from primary schools;

- i. primary schools with less than 6 classrooms
- ii. primary schools with library
- iii. primary schools without toilet facilities
- iv. primary schools with sports facilities
- v. primary schools with playground facilities
- vi. primary schools without a source of drinking water
- vii. primary schools without computer facilities

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.1 INTRODUCTION**

This chapter focused on the results obtained from data analysis and discussion of the results. It covers results on the identified primary schools, their spatial distribution and database created as well as the characteristics of the available infrastructures.

#### **4.2 PATTERN OF DISTRIBUTION OF UBE PRIMARY SCHOOLS IN KAURA LGA.**

Primary school provides the foundation for educational journey of any child. A total of 104 UBE primary schools were identified to cater for 326137 people across the study area. The geographic coordinates of each of these primary schools were collected and the concept of point on polygon overlay analysis was used to map the primary schools in the study area. See Appendix II. Identifying geographic patterns is important for understanding how geographic phenomena behave. One can get a sense of the overall pattern of features and their associated values by mapping them. Table 4.1 gives the pattern of distribution of primary schools among the various wards in the study area.

**Table 4.1 Distribution of Primary Schools among the Wards in Kaura LGA**

<b>Ward</b>	<b>No- of Schools</b>	<b>Percentage (%)</b>	<b>Functional Classrooms in the ward</b>	<b>Population</b>	<b>Ratio of Sch. in a Ward to the Pop.</b>	<b>Ratio of Functional Classrooms to Population</b>
Agban	8	7.69	45	34892	1:4362	1:775
Kukum	7	6.73	77	43293	1:6185	1:562
Fada	10	9.62	73	56302	1:5630	1:771
Kpak	8	7.69	59	66298	1:8287	1:1124
Kadarko	10	9.62	70	14149	1:1415	1:202
Mallagum	8	7.69	60	18165	1:2271	1:303
Kaura	16	15.38	122	21014	1:1313	1:172
Manchok	11	10.58	78	31576	1:2871	1:405
Bondong	15	14.42	84	29786	1:1986	1:355
Zankan	11	10.58	56	10662	1:969	1:190
<b>10</b>	<b>104</b>	<b>100</b>	<b>724</b>	<b>326137</b>	<b>1:3136</b>	

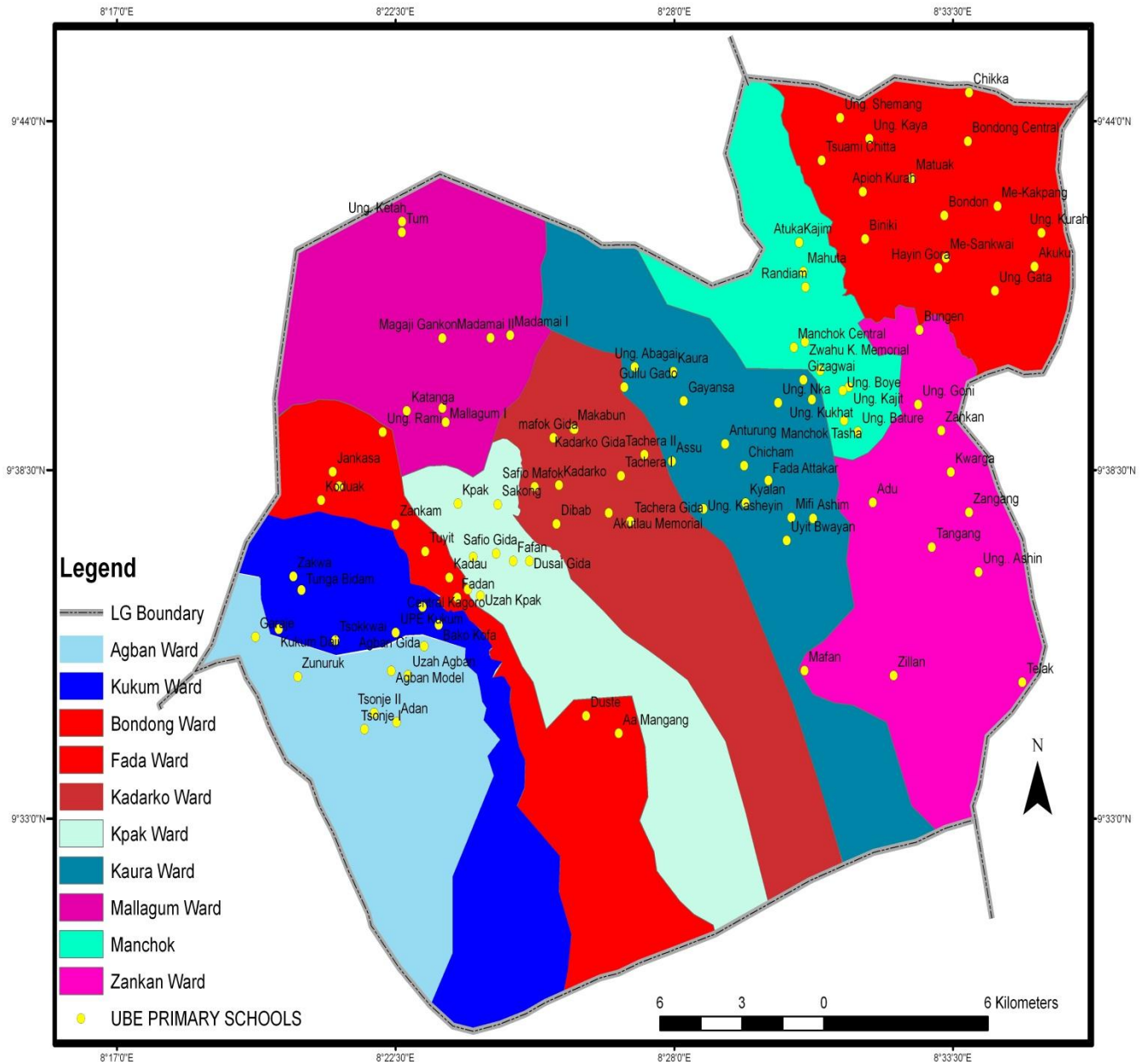
**Source: Field Survey, 2014.**

Table 4.1 clearly shows the number of schools and functional classrooms located in each administrative ward in the local government area compared to the population figures of each ward. The analysis showed that Kaura ward has the highest number of primary schools in study area with a total of 15.38% schools and 122 functional classrooms out of the 104 primary schools in the study area. However, when the available schools and functional classrooms were compared with the population figures it showed a ratio of 1:172. The table also revealed a worse situation for Kpak ward with a ratio of 1:1124. Agban and Fada wards have a bad condition with a ratio of 1:775 and 1:771 respectively. Kukum and Manchok wards were also discovered to have a very poor situation with a ratio of 1:562 and 1:405 respectively. This result exceeds the maximum number of pupils

set at 45 per class room by the Local Education Authority (LEA) and the Universal Basic Education (UBE) for the schools. This situation reveals a gross inadequacy of schools to meet up with the demand in the entire study area.

A careful consideration of the analysis of the results in table 4.1 and figure 4.1 shows that the distribution of the UBE primary schools in the Local Government has placed all wards except Zankan at disadvantage both in the number and areas served by them. This result is similar with the outcome of the work by Ayanwole and Inobeme (2009), and Abbas (2012), which they found great spatial unevenness in the distribution of secondary schools all in Zaria area.

The findings equally agree with that of Olamiju and Olujimi, (2011), which shows that there is no equitable distribution of primary educational facilities in Akure sub-region. The consequence of this is that this marked spatial variation among areas leads to spatial disparity in the living standard both within and between regions and locations (Madu, 2007). However, this is not a surprise because spatial inequality or inequality in the accessibility of infrastructure within population of a society has existed since the dawn of civilization (Aderamo and Aina, 2011).



**Figure 4.1: Spatial Distribution of Primary Schools in Kaura LGA**

**Source: Author's Analysis, 2014.**

### **4.3 DATABASE OF THE FACILITIES IN UBE PRIMARY SCHOOLS IN KAURA LGA**

This study identified the UBE Primary schools infrastructure in the study area. The geographical coordinates of all the Primary schools with relevant attribute data were collected and a GIS-Database was generated and was presented based on the administrative wards in the LGA. See appendix IV.

From the tables in appendix IV, various queries were performed on the database, it was revealed that there were 1011 female and 742 male teaching staff in the study area, only 3.59% of these teachers had obtained a Bachelor of Education Certificate, 61.61% of these teachers had National Certificate of Education (NCE), 5.02% had Diploma Certificates, 22.65% had the Teachers Grade II Certificate while 7.13% had other Certificates such as Master in Education, Senior Secondary Certificate Examination.

The database also reveals that there are a total of 724 functional classrooms in the study area which accommodated a total of 46041 pupils out of which 50.39% are Female while 49.61% are male Pupils. This shows that on an average, there are about 54 pupils in a classroom in the study area, which exceeds the maximum number of pupils set at 45 per class room by the Local Education Authority (LEA) and the Universal Basic Education (UBE) for the schools. This phenomenon suggests that there is overcrowding and overstretch of the Primary schools facilities in the study area and confirms the findings of Abbas, (2012), where he found that majority of the classrooms in Zaria and Sabon Gari LGAs are overcrowded.

## **4.4 CHARACTERISTICS OF EDUCATION INFRASTRUCTURE IN KAURA LGA**

Educational infrastructure at the primary level is responsible for growth in secondary and tertiary education. Infrastructural provision is necessary for the overall physical and socio-economic development of any region and in maintaining and sustaining livable standards within the towns and villages (Olujimi, 2000). These are expected to be provided for effective teaching – learning to take place, as well as for adequate classroom population, effective classroom climate, and standard pupil-teacher classroom ratio and pupils academic achievement to be attained among others. Ogunsaju (1980) and Asiabaka (2008) maintain that the quality of education that children receive bears direct relevance to the availability or lack, of physical facilities and overall atmosphere in which learning takes place. These facilities play pivotal role in the actualization of educational goals and objectives by satisfying the physical and emotional needs of staff and students of the school. This section looks at the status of some UBE infrastructure in the study area as revealed in the figures below:

### **4.5.1 Classroom Facilities**

Classrooms play an important role in achieving efficiency in the teaching-learning process. Hence, table 4.2 and figure 4.2 presents the number of functional classrooms and gives the distribution of schools that have less than six classrooms in the study area. Schools with less than six classrooms were considered because the 6-3-3-4 system of education introduced in 1981 provides for six years of primary education. Therefore any primary school with less than six classrooms dose not meet the minimum standard requirement.

**Table 4.2: Primary Schools with Less than 6 Blocks of Classrooms in Kaura LGA**

<b>Ward</b>	<b>Functional Classrooms in the ward</b>	<b>No- of Schools with less than 6 Blocks of classrooms</b>	<b>Percentage (%)</b>
Agban	45	4	5.8
Kukum	77	7	10.14
Fada	73	7	10.14
Kpak	59	5	7.25
Kadarko	70	8	11.6
Mallagum	60	7	10.14
Kaura	122	10	14.5
Manchok	78	8	11.6
Bondong	84	7	10.14
Zankan	56	6	8.7
<b>10</b>	<b>724</b>	<b>69</b>	<b>100</b>

**Source: Field Survey, 2014.**

Table 4.2 and Figure 4.2 shows the distribution and spatial pattern of UBE Primary schools that have less than 6 classrooms in the study area. A closer look at the table reveals that 69 primary schools out of 104 (66.35%) UBE primary schools in the study area do not have sufficient number of classrooms to accommodate the pupils from class one to six. The situation is worst in Kaura ward with 14.5%; followed by Kadarko and Manchok wards with 11.6%, while Kukum, Fada, Mallagum and Bondong wards has 10.14% each. This phenomenon agrees with the findings of Abbas (2012) on Database Management and Mapping of Secondary Education Infrastructure in Sabon-Gari and Zaria Local Government areas, Kaduna State. That the learning conditions in schools are alarming with overcrowded classrooms and generally run-down condition of many of the school buildings. The implications is rightly captured by Olaniyan and Obadara, (2008), that as a result of shortages of classrooms, classes are offered in the open air and are subjected to all problems associated with outdoor teaching such as weather fluctuations



#### 4.5.2: Library Facilities

The Library is a very important element in any level of education as they serve as knowledge source for the students and serves as the nerve centre of the educational institution. One of the basic elements to facilitate the success of Universal Basic Education programme is the library. Hence the implementation of Universal Basic Education programme can not be successful without a functional Library. Table 4.3 and figure 4.3 give the distribution of schools that have library facilities in the study area.

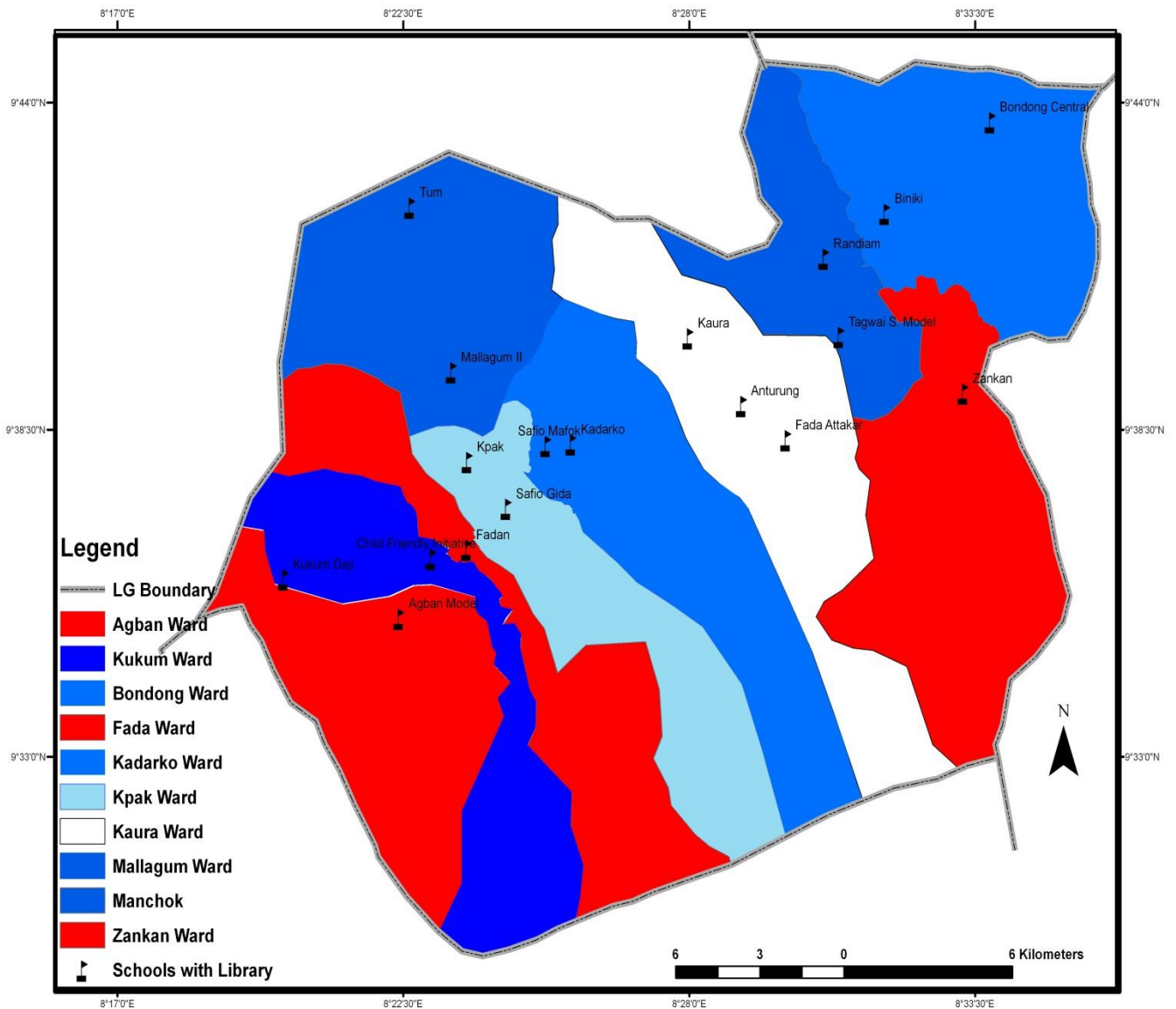
**Table 4.3 Availability of Library Facilities in Primary Schools in Kaura LGA**

Wards	Schools with Library Facilities		Schools without Library Facilities	
	Frequency	Percentage (%)	Frequency	Percentage (%)
<b>Agban</b>	1	5.56	7	8.14
<b>Kukum</b>	2	11.11	5	5.81
<b>Fada</b>	1	5.56	9	10.47
<b>Kpak</b>	2	11.11	6	6.98
<b>Kadarko</b>	2	11.11	8	9.30
<b>Mallagum</b>	2	11.11	6	6.98
<b>Kaura</b>	3	16.67	13	15.11
<b>Manchok</b>	2	11.11	9	10.47
<b>Bondong</b>	2	11.11	13	15.11
<b>Zankan</b>	1	5.56	10	11.63
<b>10</b>	<b>18</b>	<b>100</b>	<b>86</b>	<b>100</b>

Source: Field Survey, 2014.

Table 4.3 shows that only 18 out of 104 (17.31%) of the UBE primary schools in the study area are equip with library facilities. Kaura ward has the most schools with a total of 16.67% of schools with library facilities. The reason for this could be the fact the Local Government Education secretariat is located in Kaura ward which makes it easy for periodic monitoring of the schools in the ward by education officers. Kukum, Kpak, Kadarko, Mallagum, Manchok and bondong wards have 11.11% of schools with library facilities each. Agban, Fada and Zankan wards rank least with 5.56% each. This situation

was also captured by Abbas (2012), where he found that only 36% of the secondary schools in Zaria had library facilities. Furthermore, the result also reflect the findings of Abdulkareem and Umar, (1997), which show that only 9.57% of the schools in Kwara and 27.08% of the schools in FCT had school libraries while none of the schools in both Kogi and Niger States had any school library.



**Figure 4.3: Primary Schools with Library Facilities in Kaura LGA**

Source: Author's Analysis, 2014.

### 4.5.3 Toilet Facilities

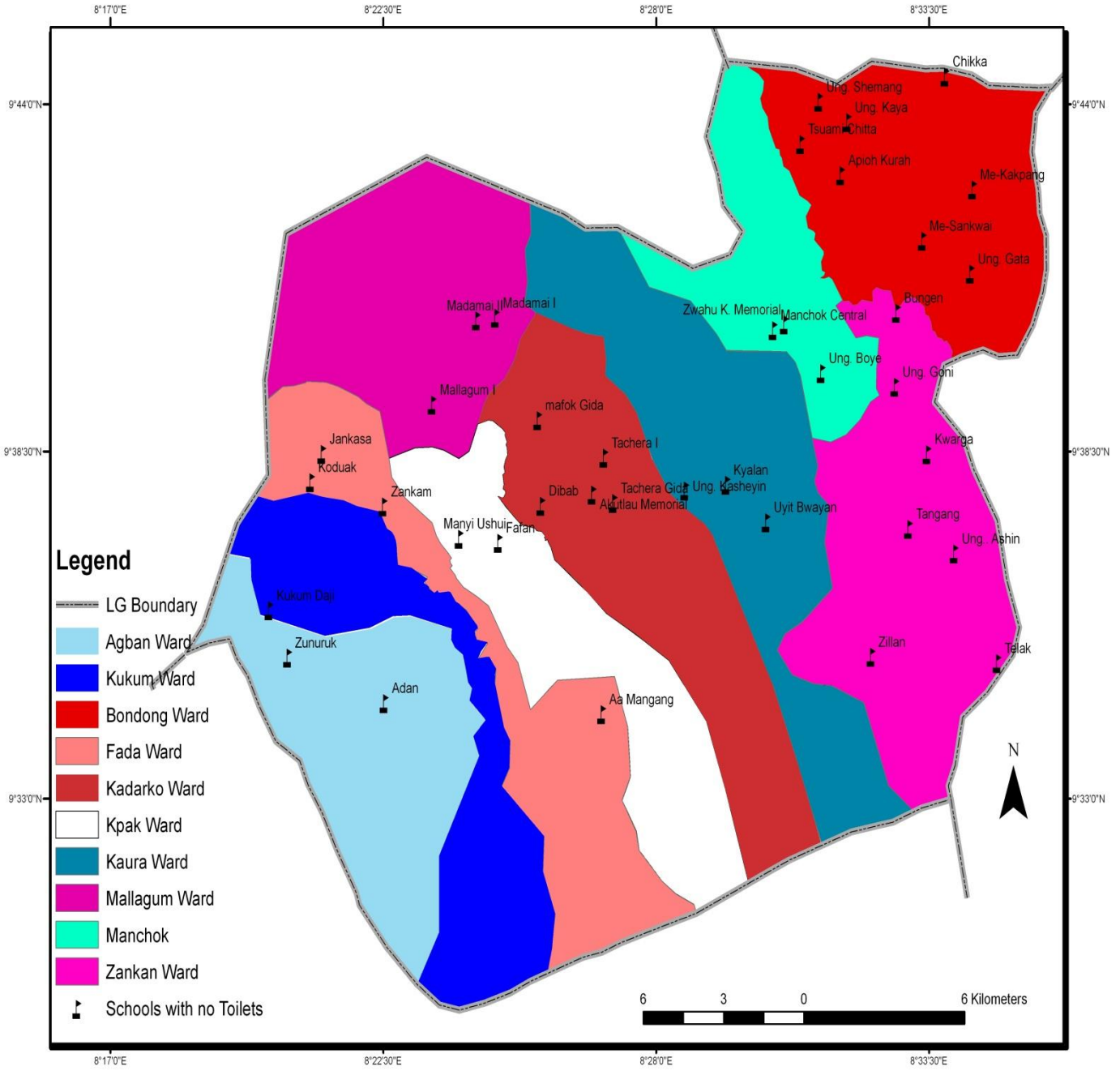
Given that health issues are known to impact on school attendance and completion Hunt, (2008), Going to a school lacking proper basic facilities, like toilets, could be having an impact on the health of the pupils. Table 4.4 and Figure 4.4 give the availability and spread of toilet facilities in the study area

**Table 4.4 Availability of Toilet Facilities in Primary Schools, Kaura LGA**

Ward	Schools without Toilets Facilities		Schools with Toilets Facilities	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Agban	2	5.26	6	9.09
Kukum	1	2.63	6	9.09
Fada	4	10.53	6	9.09
Kpak	2	5.26	6	9.09
Kadarko	5	13.16	5	7.58
Mallagum	3	7.89	5	7.58
Kaura	3	7.89	13	19.69
Manchok	3	7.89	8	12.12
Bondong	8	21.06	7	10.61
Zankan	7	18.43	4	6.06
<b>10</b>	<b>38</b>	<b>100</b>	<b>66</b>	<b>100</b>

Source: Field Survey, 2014.

The table reveals that 38 of the 104 (36.5%) UBE Primary schools in the study area do not have toilet facilities. 21.05% of the schools without toilet facilities are located in Bondong ward, 18.42% of the schools without toilet facilities are located in Zankan ward, 13.16% of the schools without toilet facilities are in Kadarko ward, and 10.53% are located in Kpak ward while Mallagum, Kaura and Manchok wards each has 7.89% of the schools without toilet facilities. Agban and Kukum wards have 5.26% and 2.63% of the primary schools without toilet facilities respectively.



**Figure 4.4 Primary Schools with out Toilets in Kaura LGA**

**Source: Author's Analysis, 2014.**

#### 4.5.4: Sports Facilities

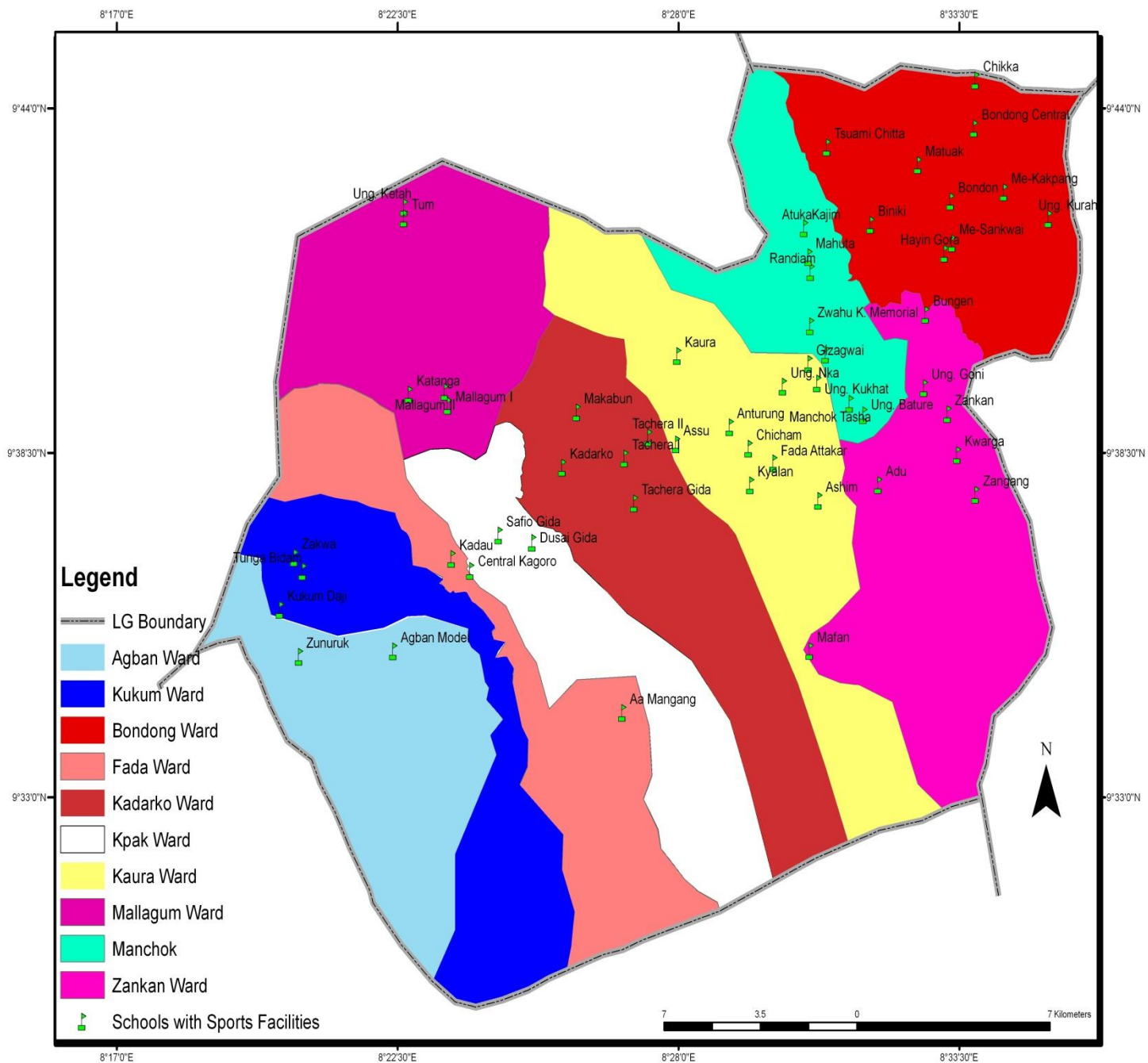
The sports facilities include among others football, jerseys, boots, football pitch and volley ball. Sport is very important to keep the pupils healthy and capture their interest to enhance an effective teaching-learning process in the schools. Table 4.5 and Figure 4.5 show the pattern of distribution of UBE primary schools with sports facilities in the study area.

**Table 4.5 Availability of Sports Facilities in Primary Schools, Kaura LGA**

Ward	Schools with Sports Facilities		Schools without Sports Facilities	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Agban	2	3.65	6	12.24
Kukum	3	5.45	4	8.17
Fada	3	5.45	7	14.29
Kpak	2	3.64	6	12.24
Kadarko	5	9.09	5	10.20
Mallagum	5	9.09	3	6.13
Kaura	11	20	5	10.20
Manchok	8	14.55	3	6.13
Bondong	10	18.18	5	10.20
Zankan	6	10.91	5	10.20
<b>10</b>	<b>55</b>	<b>100</b>	<b>49</b>	<b>100</b>

**Source: Field Survey, 2014.**

The results from table 4.5 show that out of the 104 schools in the study area, only about 55 (52.88%) UBE primary schools in the study area had some of these sports facilities. 20% of the schools with sports facilities are located in Kaura ward and this is closely followed by Bondong ward with 18.18%. 14.55% and 10.91% of the schools are located in Manchok and Zankan respectively. Kadarko and Mallagum wards each has 9.09% of the schools, 5.45% of the schools are also located in Kukum as well as Fada wards. Agban and Kpak wards both have the least number of schools with sport facilities for the pupils with only 3.64% of the schools



**Figure 4.5 Primary Schools with Sports Facilities in Kaura LGA**

**Source: Author's Analysis, 2014.**

#### 4.5.5: Playground Facilities

Child friendly facilities are required in primary schools to keep the pupils interested in the learning process. Table 4.6 and Figure 4.6 give the distribution of UBE primary schools with playground facilities across the ten wards that make up the study area.

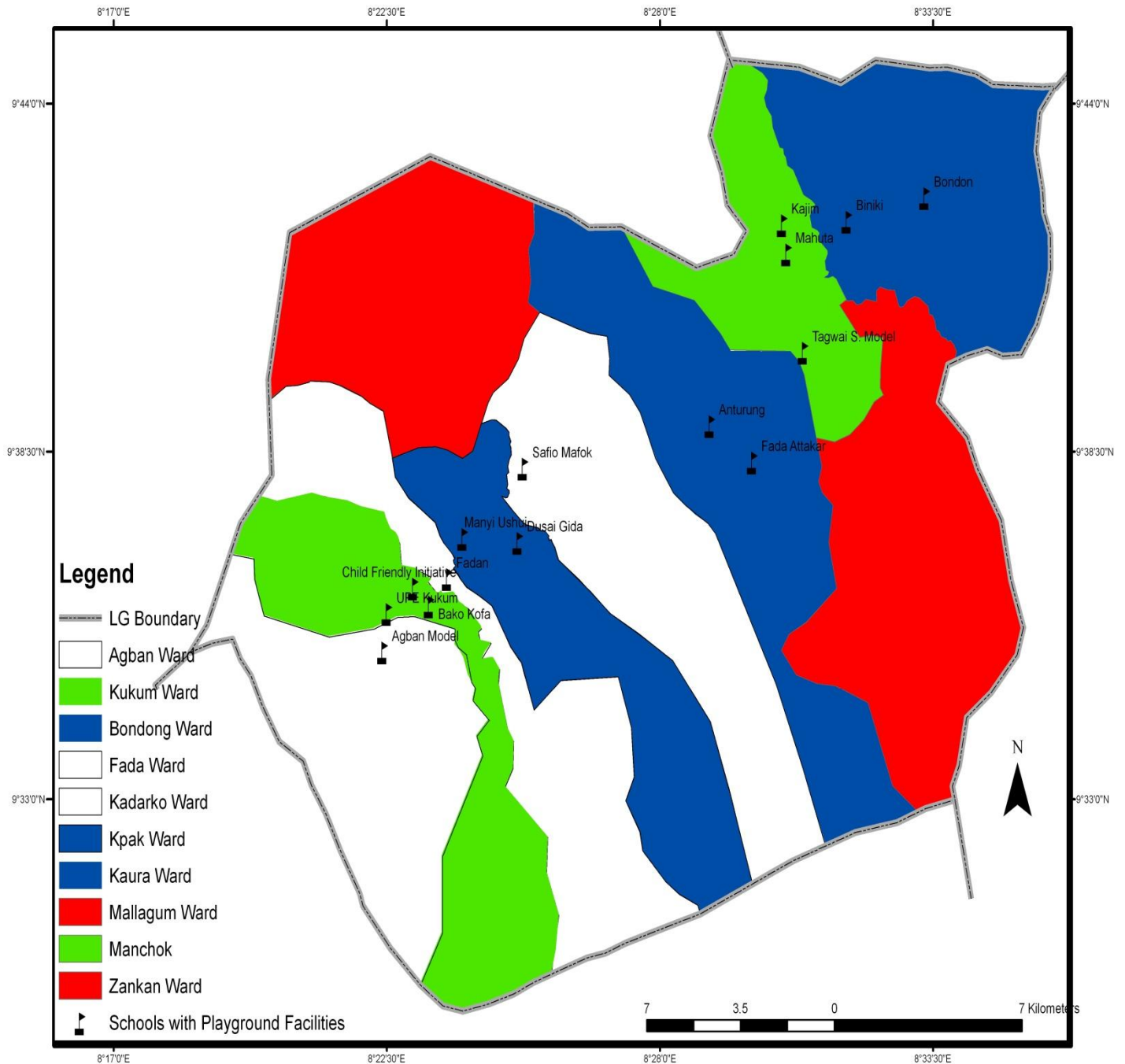
**Table 4.6 Availability of Playground Facilities in Primary Schools, Kaura LGA**

Ward	Schools with Playground Facilities		Schools without Playground Facilities	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Agban	1	6.67	7	7.87
Kukum	3	20	4	4.49
Fada	1	6.67	9	10.11
Kpak	2	13.33	6	6.74
Kadarko	1	6.67	9	10.11
Mallagum	0	0	8	8.99
Kaura	2	13.33	14	15.73
Manchok	3	20	8	8.99
Bondong	2	13.33	13	14.61
Zankan	0	0	11	12.36
<b>10</b>	<b>15</b>	<b>100</b>	<b>89</b>	<b>100</b>

**Source: Field Survey, 2014.**

Table 4.7 reveals the percentage distribution of UBE primary schools with playground facilities across the ten wards that make up the study area. From the table only 15 (14.4%) of schools have playgrounds out of 104 in the study area. This shows that 89 of the UBE Primary schools in the study area were not provided with child friendly facilities in order to capture their attention for effective teaching and learning. An examination of the table reveals that only Kukum and Manchok wards have 20% of the schools with playground facilities respectively. These were followed by Kpak, Kaura and bondong wards with 13.33% respectively. Agban, Fada and Kadarko wards each have 6.67% while Mallagum and Zankan wards lack schools that have playground facilities for their

pupils. This result corroborate that of Gouri *et al*, (2012) were they discovered that the distribution of schools having playground facilities in primary level were 32.95% across the district of Paschim Medinipur in the state of West Bengal, India.



**Figure 4.6 Primary Schools with Playground Facilities**

**Source: Author's Analysis, 2014.**

#### 4.5.6 Sources of Portable Water

Drinking water is another important elementary aspect for the school infrastructure development. Table 4.7 and Figure 4.7 give the distribution of UBE Primay schools in the study area that do not have any source of drinkable water for the pupils.

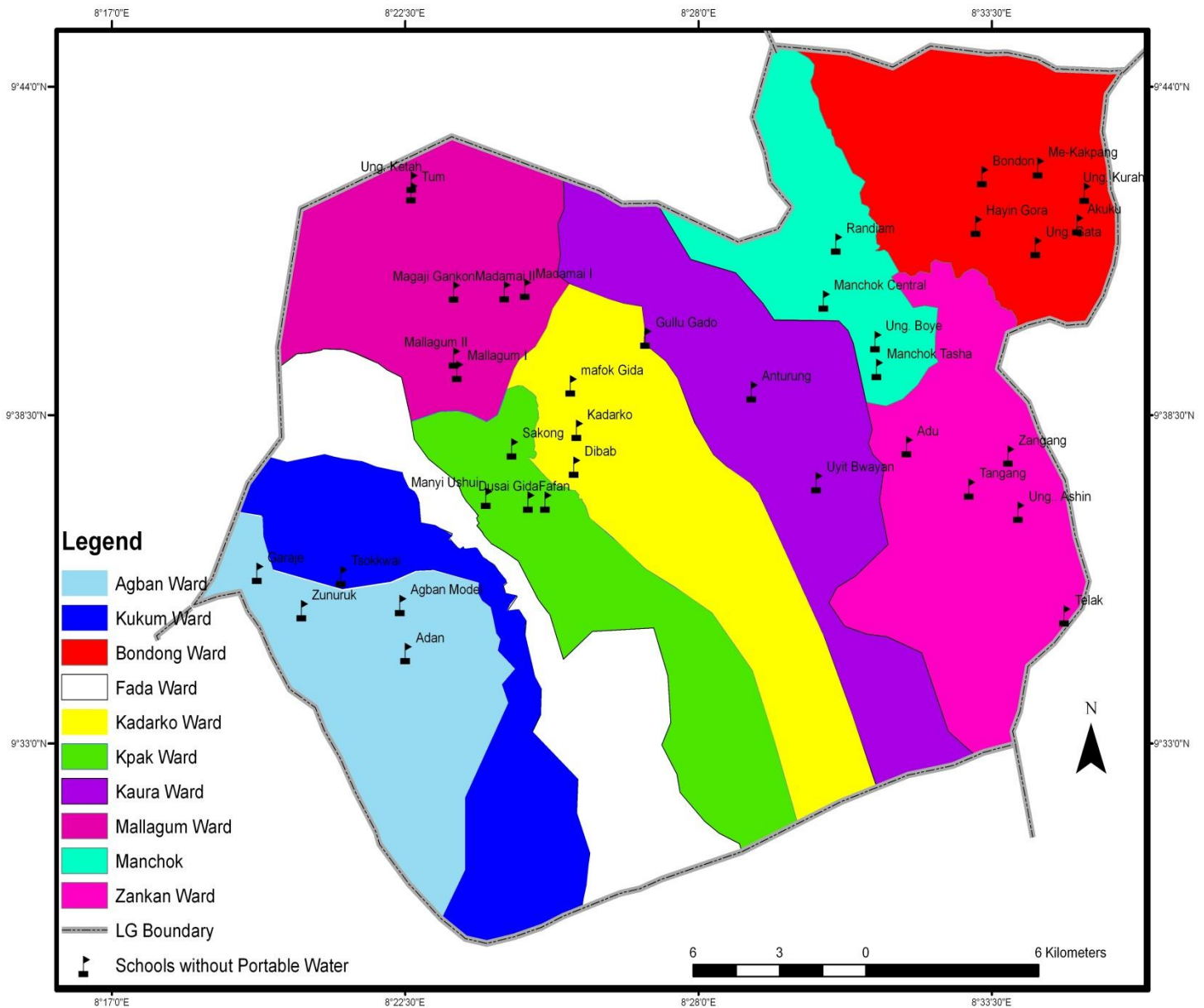
**Table 4.7 Availability of Portable Water in Primary Schools, Kaura LGA**

Ward	Schools with out Portable Water		Schools with Portable Water	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Agban	4	10.81	4	5.97
Kukum	1	2.70	6	8.96
Fada	0	0	10	14.93
Kpak	4	10.81	4	5.97
Kadarko	3	8.12	7	10.45
Mallagum	7	18.92	1	1.49
Kaura	3	8.12	13	19.40
Manchok	4	10.81	7	10.45
Bondong	6	16.22	9	13.43
Zankan	5	13.51	6	8.96
<b>10</b>	<b>37</b>	<b>100</b>	<b>67</b>	<b>100</b>

**Source: Field Survey, 2014.**

From table 4.7, it can observe that 37 out of 104 (35.58%) of the schools in the study area were not provided with any source of drinkable water. Mallagum ward has a total of 18.92%, followed by Bondong ward 16.22%, then Zankan ward with 13.51% of the primary schools. Agban and Kpak wards all have 10.81% each while Kadarko and Kaura wards are having 8.12% each. This worrying situation can be attributed to the fact most of the boreholes provided in the schools are not adequately maintained resulting to their complete breakdown.

A very unique situation is seen in Fada ward where all the primary schools are provided with at least a single source of drinking water for the pupils. Also in kukum ward it was observed that only 2.7% is yet to be provided with a source of drinking water.



**Figure 4.7 Primary Schools with out Portable Water in Kaura LGA**

**Source: Author's Analysis, 2014.**

#### 4.5.7 Computer Facilities

Table 4.8 and figure 4.8 give the distribution of availability computer laboratory in the study area.

**Table 4.8 Availability of Computer Laboratory in Primary Schools, Kaura LGA**

Ward	Schools without Computer Lab.		Schools with Computer Lab.	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Agban	8	7.69	0	0
Kukum	7	6.73	0	0
Fada	10	9.62	0	0
Kpak	8	7.69	0	0
Kadarko	10	9.62	0	0
Mallagum	8	7.69	0	0
Kaura	16	15.38	0	0
Manchok	11	10.58	0	0
Bondong	15	14.42	0	0
Zankan	11	10.58	0	0
<b>10</b>	<b>104</b>	<b>100</b>	<b>000</b>	<b>000</b>

**Source: Field Survey, 2014.**

Table 4.9 shows that none of the schools in the study area has computer laboratory either for teaching or management purposes. The reason for the none availability of computer laboratory in the entire study area can be as a result of the underfunding problem faced by the education sector in the country. Figure 4.8 displays the pattern of the distribution of UBE Primary schools without computer laboratory in the area



## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 INTRODUCTION**

This chapter presents the summary of the major findings of this study. The conclusions drawn from the findings and the recommendations made were also presented in this chapter.

#### **5.2 SUMMARY OF FINDINGS**

Given the aim of this research which is to develop a Geo-Database that will assist in managing UBE Primary Schools in Kaura Local Government Area, Kaduna State, Nigeria using Geographic Information Systems technique, the study identified and located a total of 104 Primary schools in the study area and these schools are supervised and monitored by the education department of the local government area. The study also successfully mapped out all the Primary schools and displayed their spatial location over the entire study area.

The study analyzed the pattern of distributions of the UBE Primary Schools in the study area revealing the inequality that exist between the various wards that make up the study area. This was done by finding the ratio of the functional classrooms in each ward to its entire population to be served. The results revealed a high rate of inadequacy in the entire study area with a worse situation at Kpak (1:1124), Agban (1: 775), Fada (1:771), Manchok (1:405), Bondong (1:355), and Mallagum (1:303) wards. A carefull consideration of the analysis of the results showed that the distribution of the primary

schools in the Local Government has placed all wards at disadvantage both in the number and areas served by them. Therefore in terms of spatial distribution of the primary infrastructures available in the entire study area, inequalities exist among the wards in the study area.

The database created revealed that 66.35% of the total UBE Primary Schools had less than 6 functional classrooms and Bondong ward was revealed to be most disadvantaged with a total of 22.86%. It also revealed that only 18.7% of the primary schools in the study area had Library facilities. This shows how the reading capability of the pupils is not harnessed at the grassroots level. Also, none of the schools had computer/internet facilities in the entire study area. Results revealed also that only 15.6% of the schools had playgrounds for the pupils, only 57.2% of the schools were found to be having sports facilities, 38.48% had no source of drinking water, while 39.52% of the schools had no toilet facilities. The database also reveals that there are a total of 724 functional classrooms in the study area with a total of 46041 Pupils

From the realities on ground as observed during field work, Kaura Local Government Area has a fairly good road network that aid accessibility to a majority of these Primary Schools. However, there are core remote and mountainous villages such as Dutse, Tellak, Zilland, Mafan, Zangang, Kyalan, Chicham, Ungwan Kasheyin, Apio Kura, Tsuami Chitta, Ungwan Gata and Ungwan Kaya that still suffers from poor road network.

### **5.3 CONCLUSION**

Generally, the quality of education that children receive bears direct relevance to the availability or lack, of physical facilities and overall atmosphere in which learning takes place. Therefore, this study analyzed the spatial distribution and generated a database for primary schools in Kaura Local Government Area of Kaduna state. The study has conclusively shown that there is inequality in the distribution of these educational facilities in all the ten wards comprising the study area and most of the educational infrastructure such as classrooms, toilets, libraries, computers, and playgrounds are inadequate.

This study has effectively showcased the capability of GIS as a veritable tool for decision support system for planning and management of the Universal Basic Education facilities. It is a cost effective and fair method of tracking the status of the necessary infrastructure to ensure an effective teaching–learning to take place and it should be encouraged and adopted for policy making and implementation.

The aim of this project was achieved as all the UBE primary schools were identified and mapped and a GIS database for UBE primary schools facilities in Kaura Local Government area has been developed. The spatial distribution of the schools was analysed. The database provides users with a working environment for data management. It also allows for efficient query of information needed for school administration and management.

## 5.4 RECOMMENDATIONS

The following recommendations were made based on the findings of this study:

- The deficiency in the availability of functional blocks of classrooms observed in Kpak, Agban, and Fada wards can be adequately addressed by providing additional classrooms to make up the shortfalls in the existing facilities
- Periodic upgrading of existing facilities should be carried out to meet up with the growing population.
- Education facilities such as classrooms, toilets, Libraries, sports and playground facilities, Computer/internet facilities and sources of drinking water should be provided in the schools to improve the teaching-learning process.
- This study should be replicated in other local government's areas of the states so as to come up with a comprehensive GIS-database that will help give a clear picture of what is available in terms of Primary Schools in their communities.

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**Appendix I: CHECKLIST**

**Department of Geography, Faculty of Science, Ahmadu Bello University, Zaria**

This checklist is designed to obtain information for a research study titled: *Creating a Geo-Database for Primary Schools in Kaura Local Government Area, Kaduna State, Nigeria*

I solicit your support to provide adequate and accurate information as all information provided will be used for academic purpose and treated as confidential.

Thank you.

- 1. School coordinates: Northings.....Eastings.....
- 2. School Name.....
- 3. School Address.....
- 4. School Code number.....
- 5. Year of Establishment .....
- 6. Number of Female Teachers .....
- 7. Number of Male Teachers.....
- 8. Number of Male Non-teaching Staff.....
- 9. Number of female non- teaching staff .....
- 10. Number of security.....
- 11. Number of Nannies.....
- 12. Number of Cleaners.....
- 13. Number of Teachers with B.Ed. Degree.....
- 14. Number of Teachers with NCE Certificate.....
- 15. Number of Teachers with Diploma Certificate.....
- 16. Number of Teachers with Gr. II Certificate.....
- 17. Number of Male Students in Class 1.....
- 18. Number of Female Students in Class 1.....
- 19. Number of Male Students in Class2 .....

20. Number of Female Students in Class2.....
21. Number of Male Students in Class 3 .....
22. Number of Female Students in Class 3.....
23. Number of Male Students in Class4.....
24. Number of Female Students in Class 4.....
25. Number of Male Students in Class 5.....
26. Number of Female Students in Class 5.....
27. Number of Male Students in Class 6.....
28. Number of Female Students in Class6 .....
29. Total Number of classrooms.....
30. School with Library.....
31. Source of Drinking Water.....
32. School with Sport Facilities and playground.....
33. Number of Toilets.....
34. School with Computer Facilities.....

Thanks for your corporation.

**APPENDIX II: List of UBE Primary Schools in the Study Area.**

	<b>School_Name</b>	<b>School_Address</b>
1	UBE Primary School Bako Kofa	Manyi Ukwon, Kukum Gida, Kagoro
2	Child Friendly Initiative, Kagoro	Kukum Gida, Kagoro
3	UPE Kukum Gida	Adjacent ECWA DCC, Kakum Gida, Kagoro
4	LGEA Primary School Tsonje I	Tsonje, Agban, Kagoro
5	UBE Primary School Agban Gida	Agban Gida, Kagoro
6	UBE Primary School Uzah Agban	Uzah Agban, Kagoro
7	UBE Primary Adan	Adan Agban, Kagoro
8	LGEA Model Primary School, Agban	Maraban Agban, Kagoro
9	UBE Primary School Tsonje II	Tsonje, Agban, Kagoro
10	LGEA Primary School Fadan Daji	Fadan Daji, Kagoro
11	LGEA Primary School Ung. Rami	Ungwa Rami, Kagoro
12	UBE Primary school Zankam	Zankam, Kagoro
13	UBE Primary School Jankasa	Jankasa, Kagoro
14	UBE Primary School Tuyit	Tuyit, Kagoro
15	UBE Primary School Koduak	Koduak F/Daji, Kagoro
16	LGEA Model Primary, Safio Mafok	Adjacent ECWA Church Dusai, Kagoro
17	UBE Primary School Makabun	Makabun kadarko, Kagoro
18	UBE Primary School mafok Gida	Mafok Gida Dusai, Kagoro
19	LGEA Primary School Kadarko	Adjacent ECWA Church Kadarko, Kagoro
20	UBE Primary School Dibab	Dibab Kadarko, Kagoro
21	LGEA Primary School Kadarko Gida	Kadarko Gida, Kagoro
22	UBE Primary School Dusai Gida	Dusai Gida, Kagoro
23	LGEA Primary , School Garaje	Garaje, Kagoro
24	LGEA Primary School Kukum Daji	Kukum Daji, Kagoro
25	LGEA Primary School Zunuruk	Zunuruk Agban, Kagoro
26	LGEA Primary School Zakwa	Zakwa Kukum Daji, Kagoro
27	LGEA Primary School T/Bidam	Kukum Daji, Kagoro
28	UBE Primary School Tsokkwai	Tsokkwai Kukum, Kagoro
29	UBE Primary School Ung. Ketah	Ungwan Ketah Tum, Kagoro
30	LGEA Primary School Tum	Tum, Kagoro
31	LGEA Primary School Mallagum II	Mallagum II, Kagoro
32	LGEA Primary School Mallagum I	Ajacent St. Thomas Cath. Church MallagumI, Kagoro
33	UBE Primary School MagajiGankon	Mallagum I Market Mallagum, Kagoro
34	LGEA Primary School, Katanga	Katanga, Kagoro
35	UBE Primary School Fafan	Fafan Kpak, Kagoro
36	LGEA Primary School, Safio Gida	Safio Gida, Kagoro
37	LGEA Primary School Kpak	After Turaki Buga Mem. Hospital Kpak, Kagoro
38	LGEA Primary School Madamai I	Madamai, Kagoro

39	UBE Primary School Madamai II	Madamai, Kagoro
40	UBE Primary School Sakong	Behind Development Area Kpak, Kagoro
41	UBE Primary School Uzah Kpak	Uzah Kpak(Water Board Area), Kagoro
42	UBE Primary School Manyi Ushui	Manyi Ushui, Kpak, Kagoro
43	LGEA Primary School Duste	Dutse (Hill), Kagoro
44	LGEA Model Primary School Fadan	Fada, Kagoro
45	UBE Primary School Aa Mangang	Aa Mangan Dutse, Kagoro
46	LGEA Central Primary Kagoro	Before ECWA School of Health Tech., Kpak, Kagoro
47	LGEA Primary School Kadau	Behind St. Joseph Cath. Church, Kadau, Kagoro
48	UBE Primary School Gullu Gado	Along Kaura Road Gullu Gado, Kaura
49	UBE Primary School Gayansa	Gayansa, Kaura
50	LGEA Primary School Gizagwai	Gizagwai, Manchok
51	LGEA Primary School Ung. Abagai	Ungwa Abagai, Kaura
52	LGEA Model Primary School Kaura	Opposite LGA Secretariat, Kaura
53	LGEA Primary School Ung. Nka	Ungwa Nka, Kaura
54	LGEA Primary School Mifi	Mifi, Attakar
55	LGEA Primary School Ashim	Ashim, Attakar
56	UBE Primary School Tangang	Tangang, Attakar
57	LGEA Primary School Adu	Ada, Attakar
58	LGEA Primary Ung.. Ashin	Ungwa Ashin, Attakar
59	LGEA Primary School Zillan	Zillan, Attakar
60	LGEA Primary School Zangang	Zangang, Attakar
61	UBE Primary School Uyt Bwayan	Uyt Bwayan, Attakar
62	UBE Primary School Telak	Telak, Attakar
63	LGEA Primary School Tachera II	Tachera II, Attakar
64	LGEA Primary School Anturung	Opposite St. Brenda Cath. Church Anturung, Attakar
65	LGEA Primary School Tachera I	Opposite Cath. Church Tachera I, Attakar
66	UBE Primary School, Akutlau Mem.	Tachera I, Attakar
67	UBE Primary School, Tachera Gida	Tachera Gida, Attakar
68	LGEA Primary School Assu	Assu, Attakar
69	UBE Primary School Kyalan	Kyalan, Attakar
70	UBE Primary School Ung. Kasheyin	Ungwa Kasheyin, Attakar
71	LGEA Primary School Chicham	Chichan, Attakar
72	LGEA Primary School Mafan	Mafan, Attakar
73	Model Primary School F/Attakar	Adjacent St. John Cath. Church, Fada Attakar
74	UBE Primary School, Kwarga	Along Zangan Road, Kwarga, Manchok
75	LGEA Primary School Zankan	Along Zangang Road, Zankan, Manchok
76	UBE Primary School, Ung. Bature	Unwan Bature,Sabon Gari, Manchok
77	LGEA Primary School Bungen	Bungen, Manchok
78	LGEA Primary School Ung. Goni	Ungwan Goni, Manchok
79	LGEA Primary School Ung. Kajit	Ungwan Kajit, Machok

80	LGEA Primary Manchok Central	Along Jankasa Road, Manchok
81	UBE Primary School Ung. Boye	Ung. Boye, Manchok
82	UBE Primary School Ung. Kukhat	Ungwa Kukhat, Manchok
83	LGEA Primary Manchok Tasha	Manchok Tasha, Manchok
84	Tagwai Sambo Model Prim. School	Manchok Junction, Manchok
85	Model Primary School, Bondon	Bondon, Manchok
86	UBE Primary School, Akuku	Akuku, Bondon, Manchok
87	UBE Primary School Me-Kakpang	Opposite C.K.C. Me-Kakpang, Manchok
88	LGEA Primary School Ung. Kurah	Ungwan Kurah, Bondon, Manchok
89	LGEA Primary School Ung. Gata	Ungwan Gata, Bondon, Manchok
90	LGEA Primary School Ung. Kaya	Ungwan Kaya, Biniki, Manchok
91	UBE Primary School, Apioh Kurah	Apioh Kurah, Biniki, Manchok
92	LGEA Primary School U/Shemang	Ungwan Shemang, Biniki, Manchok
93	UBE Primary School Tsuami Chitta	Tsuami Chitta, Biniki, Manchok
94	LGEA Primary School Biniki	Along Biniki Road, Biniki, Manchok
95	LGEA Primary School Randiam	Along Randiam Road, Randiam, Manchok
96	LGEA Primary School Mahuta	Along Randiam-Mahuta Road, Mahuta, Manchok
97	UBE Primary School Atuka	Atuka, Manchok
98	UBE Primary School Zwahu Mem.	Manchok
99	LGEA Primary School Kajim	Kajim, Along Mahuta Road, Manchok
100	LGEA Primary Bondong Central	Bondon, Manchok
101	LGEA Primary School Matuak	Matuak, Manchok
102	UBE Primary School Chikka	Adjacent Cath. Church, Chikka, Manchok
103	UBE Primary School Hayin Gora	Hayin Gora, Matuak, Manchok
104	UBE Primary School Me-Sankwai	Me-Sankwai, Matuak, Manchok

**Source: Field work, 2014**

### **APPENDIX III: ABBREVIATIONS USED**

1. N: Northings
2. E: Easting
3. School\_Name: School Name
4. School\_Address: School Address
5. Sch\_Code: School Code number
6. Est\_Y: Year of Establishment
7. F\_T: Number of Female Teachers
8. M\_T: Number of Male Teachers
9. M\_NTS: Number of Male Non-teaching Staff
10. F\_NTS: Number of Female Non- Teaching Staff
11. S: Number of security
12. Nan: Number of Nannies
13. Cl: Number of Cleaners
14. T\_BEEd: Number of Teachers with B.Ed. Degree
15. T\_NCE: Number of Teachers with NCE Certificate
16. T\_Dip: Number of Teachers with Diploma Certificate
17. T\_GRII: Number of Teachers with Gr. II Certificate
18. MS\_C1: Number of Male Students in Class 1
19. FS\_C1: Number of Female Students in Class 1
20. MS\_C2: Number of Male Students in Class2
21. FS\_C2: Number of Female Students in Class2
22. MS\_C3: Number of Male Students in Class 3
23. FS\_C3: Number of Female Students in Class 3
24. MS\_C4: Number of Male Students in Class4

25. FS\_C4: Number of Female Students in Class 4
26. MS\_C5: Number of Male Students in Class 5
27. FS\_C5: Number of Female Students in Class 5
28. MS\_C6: Number of Male Students in Class 6
29. FS\_C6: Number of Female Students in Class6
30. F\_CR: Total Number of Functional Classrooms
31. L\_Fac: School with Library
32. SDW: Source of Drinking Water
33. PG: School with Sport Facilities and playground
34. T: Number of Toilets
35. C\_Fac: School with Computer Facilities
36. W: Wards



FID	Sha	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F_T	M_T	M_H	F	ITS	S	Na	CI	T_B	T_H	T_D	T_G	MS	FS_C	MS	FS	MS	FS	MS	FS_C	MS	FS_C	MS	FS_C	F_C	L_F	SDW	S_F	PG	T	C_F	W
9	Point	9.63751	8.356617	Fadan Daji	Fadan Daji, Kagoro	KDP/191202712	1974	3	7	0	0	2	0	0	1	6	0	3	40	43	43	48	46	47	40	43	40	41	32	38	10	No	Boreho	No	No	6	No	Fada	
10	Point	9.65180	8.370917	Ung_Rami	Ungwa Rami, Kagoro	KDP/191208112	1976	5	12	0	0	1	0	0	2	13	0	1	42	49	38	39	33	36	33	37	34	34	34	30	6	No	Boreho	No	No	6	No	Fada	
11	Point	9.62746	8.375067	Zankam	Zankam, Kagoro	KDP/191211812	2000	4	7	0	0	1	0	0	0	7	0	2	22	21	35	34	25	20	31	20	23	27	23	20	6	No	Stream	No	No	0	No	Fada	
12	Point	9.64135	8.354467	Jankasa	Jankasa, Kagoro	KDP/191097120	2000	1	4	0	0	0	0	0	0	3	0	2	20	34	23	32	24	26	25	32	19	29	23	35	7	No	Stream	No	No	0	No	Fada	
13	Point	9.62038	8.384794	Tuyit	Tuyit, Kagoro	KDP/191211412	2000	15	1	0	0	1	1	0	0	11	0	5	14	28	36	40	37	36	36	36	36	34	37	2	No	Boreho	No	No	3	No	Fada		
14	Point	9.63386	8.350656	Koduak	Koduak F.Daji, Kagoro	KDP/	2011	2	2	0	0	0	0	0	0	2	0	2	26	23	30	20	35	23	0	0	0	0	0	0	3	No	Stream	No	No	0	No	Fada	
42	Point	9.57727	8.437756	Duste	Dutse (Hill), Kagoro	KDP/191202612	1976	0	9	0	0	0	0	0	0	7	1	1	36	35	29	40	30	40	36	30	30	28	30	29	4	No	Stream	No	No	2	No	Fada	
43	Point	9.60832	8.395358	Fadan	Fada, Kagoro	KDP/191208812	1943	24	9	2	1	2	1	0	2	21	2	4	26	35	50	51	48	59	52	58	45	57	59	62	11	Yes	Tap	No	Ye	11	No	Fada	
44	Point	9.57261	8.448453	Aa Mangang	Aa Mangang Dutse, Ka	KDP/191211312	2000	0	5	0	0	0	0	0	0	1	1	3	34	29	42	39	32	38	30	29	37	33	25	20	6	No	Boreho	Yes	No	0	No	Fada	
46	Point	9.61359	8.392714	Kadau	Behind St. Joseph Cat	KDP/191201021	1947	24	11	1	1	1	1	0	0	20	1	11	34	36	42	32	41	33	35	40	37	37	30	40	18	No	Boreho	Yes	No	18	No	Fada	

**Table 4.2.3 A GIS Database for Primary schools facilities in Fada Ward**

**Source: Author's Analysis, 2014.**

FID	Sha	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F_T	M_T	M_H	F	ITS	S	Na	CI	T_B	T_H	T_D	T_G	MS	FS_C	MS	FS	MS	FS	MS	FS_C	MS	FS_C	F_C	L_F	SDW	S_F	PG	T	C_F	W	
15	Point	9.63740	8.420814	Safio Mafok	Adjacent ECWA Churc	KDP/22281	1973	14	12	2	2	2	1	1	2	16	2	1	60	50	55	56	56	53	54	54	52	53	42	48	10	Yes	Boreho	No	Ye	3	No	Kadarko
16	Point	9.65260	8.433597	Makabun	Makabun kadarko, Kag	KDP/191204312	1976	13	6	2	2	2	0	0	12	2	3	41	43	36	40	36	37	38	35	37	40	36	41	8	No	Boreho	Yes	No	4	No	Kadarko	
17	Point	9.65026	8.426992	mafok Gida	Mafok Gida Dusai, Kag	KDP/191203012	2000	13	5	0	0	0	1	0	0	9	1	6	51	67	45	59	42	56	39	54	33	50	28	48	6	No	No	No	No	0	No	Kadarko
18	Point	9.63788	8.428858	Kadarko	Adjacent ECWA Churc	KDP/191203112	1949	12	9	0	1	0	1	0	2	11	0	6	50	47	40	46	40	49	50	40	40	45	30	39	8	Yes	No	Yes	No	4	No	Kadarko
19	Point	9.62762	8.428042	Dibab	Dibab Kadarko, Kagor	KDP/191205512	2005	7	7	1	0	1	0	1	2	2	0	10	40	35	30	49	49	30	50	30	33	42	30	38	5	No	No	No	No	0	No	Kadarko
20	Point	9.65253	8.433964	Kadarko Gida	Kadarko Gida, Kagoro	KDP/191203012	1999	8	5	0	0	1	1	0	1	7	1	3	29	44	45	35	35	49	40	48	40	50	40	7	8	No	Boreho	No	No	2	No	Kadarko
62	Point	9.64586	8.456969	Tachera II	Tachera II, Attakar	KDP/191205912	1976	1	7	2	0	2	0	0	6	1	1	36	35	33	36	33	36	34	35	32	33	31	33	7	No	Stream	Yes	No	4	No	Kadarko	
64	Point	9.6403	8.449222	Tachera I	Opposite Cath. Church	KDP/191205812	1973	2	8	2	1	2	1	0	1	7	0	2	41	46	38	43	43	37	41	41	39	36	31	30	8	No	Boreho	Yes	No	0	No	Kadarko
65	Point	9.63057	8.445208	Akutlau Memo	Tachera I, Attakar	KDP/191211012	2009	3	4	0	0	0	0	0	5	0	2	28	30	29	29	28	26	23	24	24	24	0	0	6	No	Stream	No	No	0	No	Kadarko	
66	Point	9.62836	8.452314	Tachera Gida	Tachera Gida, Attakar	KDP/191210812	2005	1	5	0	0	0	0	0	3	0	3	25	24	20	19	21	22	23	20	19	18	14	19	4	No	Stream	Yes	No	0	No	Kadarko	

**Table 4.2.4 A GIS Database for Primary schools facilities in Kadarko Ward**

**Source: Author's Analysis, 2014.**

Selected Attributes of UBE Primary Schools																																																				
FD	Sha	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F	T	M	T	M	N	F	N	T	S	Ha	Cl	T	B	T	N	T	D	T	G	MS	FS	C	MS	FS	MS	FS	MS	FS	C	MS	FS	C	F	C	L	F	SDW	S	F	PG	T	C	F	W
47	Point	9.66359	8.450319	Gullu Gado	Along Kaura Road Gull	KDP/191211212	2000	7	17	1	4	1	4	0	1	15	1	3	24	25	23	27	23	26	21	28	26	29	23	23	4	No	No	No	No	3	No	Kaura														
48	Point	9.65993	8.469897	Gayansa	Gayansa, Kaura	KDP/191209512	2000	11	7	1	2	1	2	0	0	7	0	6	24	25	23	26	23	24	21	17	20	19	22	16	2	No	Boreho	No	No	6	No	Kaura														
49	Point	9.66548	8.509256	Gizagwai	Gizagwai, Manchok	KDP/191202912	1962	15	10	0	0	1	5	0	1	13	3	8	22	23	20	23	20	22	19	23	25	22	27	26	20	No	Boreho	Yes	No	6	No	Kaura														
50	Point	9.66886	8.453736	Ung. Abagai	Ungwa Abagai, Kaura	KDP/191206812	1991	7	7	0	0	1	0	1	8	0	3	20	21	16	24	17	22	15	18	9	21	17	17	4	No	Boreho	No	No	3	No	Kaura															
51	Point	9.66761	8.466439	Kaura	Opposite LGA Secreta	KDP/191205312	1949	17	9	1	3	1	3	0	1	17	1	8	31	30	29	27	25	29	28	25	24	23	22	25	14	Yes	Boreho	Yes	No	6	No	Kaura														
52	Point	9.65947	8.500928	Ung. Nkia	Ungwa Nkia, Kaura	KDP/191208012	1976	11	6	0	0	1	2	0	2	9	1	3	31	25	18	6	6	19	25	19	15	18	23	15	6	No	Boreho	Yes	No	12	No	Kaura														
53	Point	9.62929	8.505325	Mifi	Mifi, Attakar	KDP/191204912	1976	6	8	0	0	1	1	0	0	12	0	2	49	48	45	45	44	43	44	42	43	41	40	39	8	No	Boreho	No	No	3	No	Kaura														
54	Point	9.62908	8.512447	Ashim	Ashim, Attakar	KDP/191201812	1974	8	3	0	0	0	0	0	2	5	0	1	37	38	34	36	31	35	30	32	29	31	35	28	8	No	Stream	Yes	No	6	No	Kaura														
60	Point	9.62328	8.503747	Uyit Bwayan	Uyit Bwayan, Attakar	KDP/	2011	4	2	0	0	0	0	0	0	2	0	4	21	19	16	13	12	13	0	0	0	0	0	0	3	No	No	No	0	No	Kaura															
63	Point	9.64866	8.483514	Anturung	Opposite St. Brenda C	KDP/62270	1942	7	9	2	3	1	3	0	0	9	1	6	41	43	42	43	40	35	40	42	40	39	28	33	13	Yes	No	Yes	Yes	4	No	Kaura														
67	Point	9.64409	8.465994	Assu	Assu, Attakar	KDP/191201912	1975	4	5	1	1	1	0	0	5	0	4	40	35	38	35	33	35	34	33	35	33	32	32	4	No	Stream	Yes	No	2	No	Kaura															
68	Point	9.63314	8.490231	Kyalan	Kyalan, Attakar	KDP/191210412	2006	10	2	0	0	0	1	0	0	6	1	6	29	28	27	26	28	27	30	29	29	30	28	30	4	No	Stream	Yes	No	0	No	Kaura														
69	Point	9.63161	8.476378	Ung. Kasheyin	Ungwa Kasheyin, Atta	KDP/191207512	2000	3	8	0	0	2	1	0	0	4	1	6	33	31	31	30	33	31	32	30	30	32	27	30	6	No	Stream	No	No	0	No	Kaura														
70	Point	9.64296	8.489731	Chicham	Chicham, Attakar	KDP/191202412	1976	7	5	0	0	2	2	0	0	5	1	6	38	39	35	34	33	38	35	35	31	33	32	34	6	No	Boreho	Yes	No	2	No	Kaura														
72	Point	9.63905	8.497761	Fada Attakar	Adjacent St. John Cat	KDP/191205212	1962	7	9	0	1	3	1	0	1	12	0	6	48	46	47	45	48	47	40	48	42	45	41	40	12	Yes	Boreho	Yes	Yes	6	No	Kaura														
81	Point	9.66031	8.51205	Ung. Kukhat	Ungwa Kukhat, Manch	KDP/191207812	2000	7	4	2	1	2	1	0	0	7	0	2	38	35	43	40	35	34	37	40	31	30	38	39	8	No	Boreho	Yes	No	4	No	Kaura														

**Table 4.2.5 A GIS Database for Primary schools facilities in Kaura Ward**

Source: Author's Analysis, 2014.

Selected Attributes of UBE PRIMARY SCHOOLS																																																				
FD	Sha	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F	T	M	T	M	N	F	N	T	S	Ha	Cl	T	B	T	N	T	D	T	G	MS	FS	C	MS	FS	MS	FS	MS	FS	C	MS	FS	C	F	C	L	F	SDW	S	F	PG	T	C	F	W
21	Point	9.61788	8.419064	Dusai Gida	Dusai Gida, Kagoro	KDP/191209412	2001	7	6	0	0	0	0	0	0	0	0	0	0	0	6	2	1	36	37	0	33	35	37	34	35	32	35	26	28	6	No	No	Yes	Yes	2	No	Kpak									
34	Point	9.61789	8.413733	Fafan	Fafan Kpak, Kagoro	KDP/191212215	2002	12	4	0	0	0	0	0	0	0	0	0	13	1	2	40	45	40	41	39	33	32	33	35	37	36	33	4	No	No	No	No	0	No	Kpak											
35	Point	9.61984	8.408106	Safio Gida	Safio Gida, Kagoro	KDP/191205712	1990	20	5	2	1	2	1	0	1	19	0	5	47	43	45	46	48	49	47	42	40	41	36	37	14	Yes	Tap an	Yes	No	6	No	Kpak														
36	Point	9.63295	8.395589	Kpak	After Turaki Buga Me	KDP/191203612	1967	13	4	0	0	2	1	0	0	17	1	0	40	59	59	43	42	62	52	50	37	39	38	36	7	Yes	Boreho	No	No	3	No	Kpak														
39	Point	9.63273	8.408628	Sakong	Behind Development A	KDP/191210712	2006	14	6	1	0	1	0	0	0	16	0	3	41	42	45	40	40	45	44	40	40	42	30	31	4	No	No	No	No	2	No	Kpak														
40	Point	9.60877	8.402969	Uzahn Kpak	Uzahn Kpak(Water Bos	KDP/191211612	2007	13	2	0	0	0	1	0	0	11	0	4	35	36	36	39	32	29	25	28	21	24	20	23	8	No	Tap	No	No	10	No	Kpak														
41	Point	9.61896	8.400556	Manyi Ushui	Manyi Ushui, Kpak, Ka	KDP/191210001	2007	14	2	1	1	1	1	0	1	11	0	4	22	25	27	25	24	25	24	27	22	21	20	21	2	No	No	No	Yes	0	No	Kpak														
45	Point	9.61043	8.398819	Central Kagor	Before ECOMA School	KDP/191202212	1928	23	8	0	0	2	0	0	1	21	1	7	52	44	53	51	40	44	39	30	36	39	26	33	14	No	Tap an	Yes	No	16	No	Kpak														

**Table 4.2.6 A GIS Database for Primary schools facilities in Kpak Ward**

Source: Author's Analysis, 2014.

Selected Attributes of ODC PRIMARY SCHOOLS																																						
ID	Sha	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F_T	M_T	M_W	F_NTS	S	Wa	Cl	T_B	T_W	T_D	T_G	MS	FS_C	MS	FS	MS	FS	MS	FS_C	MS	FS_C	MS	FS_C	F_C	L_F	SDW	S_F	PG	T	C_F	W
0	Point	9.60113	8.389275	Bako Kofa	Manyi Ukwon, Kukum	KDP191209120	2000	19	9	3	1	3	1	0	1	16	1	6	43	43	44	46	48	45	45	41	45	41	43	40	14	No	Boreho	No	Yes	10	No	Kukum
1	Point	9.60586	8.383947	Child Friendly I	Kukum Gida, Kagoro	KDP191202312	1957	22	13	1	2	1	1	1	3	28	1	3	62	58	54	57	52	53	57	84	59	61	50	58	10	Yes	Boreho	No	Yes	3	No	Kukum
2	Point	9.59910	8.375194	UPE Kukum	Adjacent ECOMA DCC	KDP191203812	1976	22	11	0	0	2	0	0	2	24	1	5	30	35	29	31	7	34	37	33	35	39	37	39	40	No	Boreho	No	Yes	2	No	Kukum
23	Point	9.60003	8.336719	Kukum Daji	Kukum Daji, Kagoro	KDP191203712	1947	21	2	0	0	0	0	0	19	0	4	33	38	37	34	36	39	36	33	33	36	34	32	12	Yes	Tap an	Yes	No	0	No	Kukum	
25	Point	9.61387	8.344472	Zakwa	Zakwa Kukum Daji, Ka	KDP191208312	1974	29	8	1	2	1	2	0	0	21	7	9	58	59	56	48	57	54	56	53	54	54	53	55	9	No	Boreho	Yes	No	3	No	Kukum
26	Point	9.61029	8.344189	Tunga Bidadan	Kukum Daji, Kagoro	KDP191206712	1976	13	10	0	2	2	2	0	0	14	3	6	57	58	62	53	63	54	63	52	47	47	51	50	12	No	Well	Yes	No	4	No	Kukum
27	Point	9.59709	8.355281	Tsokkwai	Tsokkwai Kukum, Kag	KDP191206512	2000	25	7	1	0	1	0	0	4	25	0	3	44	41	40	43	39	40	36	40	40	39	36	38	6	No	No	No	No	2	No	Kukum

**Table 4.2.7 A GIS Database for Primary schools facilities in Kukum Ward**

**Source: Author's Analysis, 2014.**

Selected Attributes of UBE PRIMARY SCHOOLS																																						
ID	Sha	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F_T	M_T	M_W	F_NTS	S	Wa	Cl	T_B	T_W	T_D	T_G	MS	FS_C	MS	FS	MS	FS	MS	FS_C	MS	FS_C	MS	FS_C	F_C	L_F	SDW	S_F	PG	T	C_F	W
28	Point	9.70709	8.377283	Ung. Ketah	Ungwan Ketah Tum, K	KDP191207712	2000	7	8	0	1	0	1	0	0	9	3	3	8	44	46	44	44	47	47	44	37	43	41	6	No	No	Yes	No	1	No	Mallagu	
29	Point	9.70423	8.377206	Tum	Tum, Kagoro	KDP02791	1953	13	9	0	1	0	0	1	0	14	3	4	57	55	55	57	55	57	55	54	52	50	54	51	7	Yes	No	Yes	No	1	No	Mallagu
30	Point	9.65807	8.390503	Mallagum II	Mallagum II, Kagoro	KDP191204512	1973	11	10	0	0	0	0	2	14	2	3	52	51	48	49	54	58	48	46	59	57	58	51	10	Yes	No	Yes	No	3	No	Mallagu	
31	Point	9.65434	8.391508	Mallagum I	Ajacent St. Thomas C	KDP02697	1962	16	6	0	2	1	2	0	1	11	3	6	36	43	53	44	43	40	40	45	43	44	40	49	58	No	Yes	No	0	No	Mallagu	
32	Point	9.67647	8.390469	Magaji Gankon	Mallagum I Market Mall	KDP191209912	2000	13	7	0	0	1	0	0	13	1	6	57	54	51	49	50	54	54	52	56	50	53	49	4	No	No	No	No	2	No	Mallagu	
33	Point	9.65732	8.378628	Katanga	Katanga, Kagoro	KDP191203413	1993	12	10	1	0	1	0	0	12	0	10	55	49	54	50	50	53	47	47	47	42	47	45	7	No	Stream	Yes	No	3	No	Mallagu	
37	Point	9.67723	8.412747	Madamai I	Madamai, Kagoro	KDP191203912	1976	2	8	0	0	1	0	0	0	8	0	2	35	36	37	38	30	24	31	33	27	34	25	26	6	No	No	No	No	0	No	Mallagu
38	Point	9.67655	8.406325	Madamai II	Madamai, Kagoro	KDP191208120	2000	0	11	0	0	1	0	0	0	8	1	2	31	30	30	29	38	37	29	27	40	38	26	27	6	No	No	No	No	0	No	Mallagu

**Table 4.2.8 A GIS Database for Primary schools facilities Mallagum Ward**

**Source: Author's Analysis, 2014.**







### 3 Distributions of Primary Schools with no Toilet Facilities

FD	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est	Y	F	T	M	F	HT	S	Ilan	Cl	T	T	T	D	T	MS	FS	C	MS	FS	C	MS	FS	MS	FS	MS	FS	C	F	L	F	SDW	S	Fa	PG	T	C
6	9.575575	8.375433	UBE Adan	Adan Agban, Kagoro	KDP/1912111120	2009	3	8	0	0	0	0	0	0	0	7	1	2	35	42	38	40	39	38	57	54	0	0	0	0	0	2	No	No	No	No	No	0	No			
11	9.627464	8.375067	UBE Zankam	Zankam, Kagoro	KDP/1912118120	2000	4	7	0	0	1	0	0	0	0	7	0	2	22	21	35	34	25	20	31	20	23	27	23	20	6	No	Stream	No	No	No	0	No				
12	9.641358	8.354467	UBE Jankasa	Jankasa, Kagoro	KDP/191097120	2000	1	4	0	0	0	0	0	0	0	3	0	2	20	34	23	32	24	26	25	32	19	29	23	35	7	No	Stream	No	No	No	0	No				
14	9.633864	8.350656	UBE Koduak	Koduak F.Daji, Kagoro	KDP/	2011	2	2	0	0	0	0	0	0	0	2	0	2	26	23	30	20	35	23	0	0	0	0	0	0	3	No	Stream	No	No	No	0	No				
17	9.650264	8.426992	UBE mafok Gida	Mafok Gida Dusai, Kagoro	KDP/1912030120	2000	13	5	0	0	0	1	0	0	9	1	6	51	67	45	59	42	56	39	54	33	50	28	48	6	No	No	No	No	No	0	No					
19	9.627625	8.428042	UBE Dibab	Dibab Kadarko, Kagoro	KDP/1912055120	2005	7	7	1	0	1	0	1	2	2	0	1	40	35	30	49	49	30	50	30	33	42	30	38	5	No	No	No	No	No	0	No					
23	9.600039	8.336719	LGEA Kukum Daji	Kukum Daji, Kagoro	KDP/1912037120	1947	21	2	0	0	0	0	0	0	19	0	4	33	38	37	34	36	39	36	33	33	36	34	32	12	Yes	Tap and	Yes	No	No	0	No					
24	9.587536	8.342939	LGEA Zunuruk	Zunuruk Agban, Kagoro	KDP/1012087120	1976	24	10	0	0	0	0	0	2	24	4	4	49	45	48	46	46	41	42	45	41	45	41	44	6	No	No	Yes	No	No	0	No					
31	9.654342	8.391508	LGEA Mallagum I	Adjacent St. Thomas Cath. Church Mall	KDP/02697	1962	16	6	0	2	1	2	0	1	11	3	6	36	43	53	44	43	40	40	45	43	44	40	49	58	No	No	Yes	No	No	0	No					
34	9.617894	8.413733	UBE Fafan	Fafan Kpak, Kagoro	KDP/1912122151	2002	12	4	0	0	0	0	0	0	13	1	2	40	45	40	41	39	33	32	33	35	37	36	33	4	No	No	No	No	No	0	No					
37	9.677231	8.412747	LGEA Madamai I	Madamai, Kagoro	KDP/1912039120	1976	2	8	0	0	1	0	0	0	8	0	2	35	36	37	38	30	24	31	33	27	34	25	26	6	No	No	No	No	No	0	No					
38	9.676553	8.406325	UBE Madamai II	Madamai, Kagoro	KDP/191208120	2000	0	11	0	0	1	0	0	0	8	1	2	31	30	30	29	38	37	29	27	40	38	26	27	6	No	No	No	No	No	0	No					
41	9.618964	8.400556	UBE Many Ushui	Manyi Ushui, Kpak, Kagoro	KDP/19121000120	2007	14	2	1	1	1	1	0	1	11	0	4	22	25	27	25	24	25	24	27	22	21	20	21	2	No	No	No	Yes	No	0	No					
44	9.572617	8.448453	UBE Aa Mangang	Aa Mangan Dutse, Kagoro	KDP/1912113120	2000	0	5	0	0	0	0	0	0	1	1	3	34	29	42	39	32	38	30	29	37	33	25	20	6	No	Borehole	Yes	No	No	0	No					
55	9.621556	8.551531	UBE Tangang	Tangang, Attakar	KDP/1912061120	2000	3	4	1	0	1	0	0	0	4	0	2	44	43	43	41	40	42	38	38	36	37	34	35	6	No	No	No	No	No	0	No					
57	9.615033	8.566919	LGEA Ung. Ashin	Ungwa Ashin, Attakar	KDP/1912069120	1999	1	8	0	0	0	0	0	0	5	2	2	37	35	35	32	30	31	30	32	33	30	28	26	2	No	No	No	No	No	0	No					
58	9.587789	8.538942	LGEA Zillan	Zillan, Attakar	KDP/1912086120	1993	0	8	0	0	1	0	0	0	6	0	2	44	46	42	45	40	38	41	40	40	43	38	34	4	No	Stream	No	No	No	0	No					
60	9.623281	8.503747	UBE Uyt Bwayan	Uyt Bwayan, Attakar	KDP/	2011	4	2	0	0	0	0	0	0	2	0	4	21	19	16	13	12	13	0	0	0	0	0	0	3	No	No	No	No	No	0	No					
61	9.586089	8.581269	UBE Telak	Telak, Attakar	KDP/1912114120	2010	1	2	0	0	0	0	0	1	0	0	2	30	39	35	34	22	28	0	0	0	0	0	0	2	No	No	No	No	No	0	No					
64	9.6403	8.449222	LGEA Tachera I	Opposite Cath. Church Tachera I, Atta	KDP/1912058120	1973	2	8	2	1	2	1	0	1	7	0	2	41	46	38	43	43	37	41	41	39	36	31	30	8	No	Borehole	Yes	No	No	0	No					
65	9.630575	8.445208	UBE Akutlau Mem.	Tachera I, Attakar	KDP/1912110120	2009	3	4	0	0	0	0	0	0	5	0	2	28	30	29	29	28	26	23	24	24	24	0	0	6	No	Stream	No	No	No	0	No					
66	9.628369	8.452314	UBE, Tachera G.	Tachera Gida, Attakar	KDP/1912108120	2005	1	5	0	0	0	0	0	0	3	0	3	25	24	20	19	21	22	23	20	19	18	14	19	4	No	Stream	Yes	No	No	0	No					
68	9.633142	8.490231	UBE Kyalan	Kyalan, Attakar	KDP/1912104120	2006	10	2	0	0	0	1	0	0	6	1	6	29	28	27	26	28	27	30	29	29	30	28	30	4	No	Stream	Yes	No	No	0	No					
69	9.631619	8.476378	UBE Ung. Kasheyin	Ungwa Kasheyin, Attakar	KDP/1912075120	2000	3	8	0	0	2	1	0	0	4	1	3	33	31	31	30	33	31	32	30	30	32	27	30	6	No	Stream	No	No	No	0	No					
73	9.64125	8.557783	UBE, Kwarga	Along Zangan Road, Kwarga, Mancho	KDP/1912119120	2007	3	5	0	0	0	0	0	0	5	1	1	24	22	26	16	19	25	19	21	15	13	13	10	6	No	Borehole	Yes	No	No	0	No					
76	9.678561	8.547497	LGEA Bungen	Bungen, Mancho	KDP/1912021120	1976	2	7	1	0	1	0	0	0	5	1	3	36	35	43	38	47	43	43	34	30	29	20	6	No	Well	Yes	No	No	0	No						
77	9.659058	8.546997	LGEA Ung. Goni	Ungwan Goni, Mancho	KDP/9302883	1993	5	6	0	2	0	2	0	0	4	0	4	43	40	41	42	39	42	42	40	40	42	41	33	4	No	Borehole	Yes	No	No	0	No					
79	9.674003	8.506094	LGEA Mancho Centr	Along Jankasa Road, Mancho	KDP/1912046120	1954	22	4	1	2	1	2	0	0	18	0	1	33	30	38	41	43	41	41	38	38	38	38	48	3	No	No	No	No	No	0	No					
80	9.662658	8.522217	UBE Ung. Boye	Ung. Boye, Mancho	KDP/1912071120	2000	9	8	0	0	0	0	0	1	8	0	6	41	43	34	32	31	30	30	36	31	30	31	30	4	No	No	No	No	No	0	No					
86	9.711128	8.5731	UBE Me-Kakpang	Opposite C.K.C. Me-Kakpang, Mancho	KDP/1912011120	2007	4	1	0	0	0	0	0	0	3	1	1	21	25	18	18	24	23	20	22	19	20	19	19	6	No	No	Yes	No	No	0	No					
88	9.688892	8.572286	LGEA Ung. Gata	Ungwan Gata, Bondon, Mancho	KDP/1912072120	1976	5	5	0	0	0	0	0	9	1	0	29	31	26	29	30	32	31	28	26	28	25	24	4	No	No	No	No	No	0	No						
89	9.728869	8.530972	LGEA Ung. Kaya	Ungwan Kaya, Biniki, Mancho	KDP/1912076120	1975	5	7	1	0	1	0	0	1	5	0	4	32	35	37	36	31	33	34	34	30	33	39	30	4	No	Stream	No	No	No	0	No					
90	9.714883	8.528789	UBE, Apioh Kurah	Apioh Kurah, Biniki, Mancho	KDP/191269012	2007	3	4	0	2	0	2	0	0	2	0	3	35	33	30	27	30	32	27	26	21	28	21	24	2	No	Borehole	No	No	No	0	No					
91	9.734292	8.521397	LGEA, Ung. Shemang	Ungwan Shemang, Biniki, Mancho	KDP/1912082120	1976	0	7	1	0	1	0	0	0	5	0	2	37	39	35	36	37	36	34	37	32	30	31	32	4	No	Stream	No	No	No	0	No					
92	9.723106	8.515264	UBE Tsuami Chitta	Tsuami Chitta, Biniki, Mancho	KDP/1912062120	2000	7	7	0	0	0	0	0	0	4	0	3	33	34	32	31	30	31	29	28	23	28	20	19	2	No	Stream	Yes	No	No	0	No					
97	9.675486	8.509789	UBE Zwahu K. Mem.	Mancho	KDP/1920020	2000	18	6	0	2	0	1	1	0	15	2	6	37	38	34	35	33	32	33	32	29	31	30	29	4	No	Borehole	Yes	No	No	0	No					
101	9.740939	8.5838	UBE Chikka	Adjacent Cath. Church, Chikka, Mancho	KDP/1912093120	2000	1	7	1	2	1	2	0	0	5	0	3	45	40	43	41	44	40	42	49	48	43	40	35	6	No	Stream	Yes	No	No	0	No					
103	9.697564	8.558147	UBE Me-Sankwai	Me-Sankwai, Matuak, Mancho	KDP/1912102120	2007	6	4	0	0	0	1	0	0	7	1	2	30																								

#### 4 Distribution of Primary Schools with Sports Facilities

FID	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F	T	M	L	F_IT	S	Ilan	Cl	T	T	T	D	T	MS	FS_C	MS	FS_C	MS_C	FS	MS	FS	MS	FS	MS	FS_C	F	L	F	SDW	S_Fa	PG	T	C
7	9.589028	8.373728	LGEA Model Agban	Maraban Agban, Kagoro	KDPA19120500120	1950	33	13	2	2	2	1	1	2	37	3	4	57	59	56	58	53	46	54	57	50	51	43	44	14	Yes	No	Yes	Yes	8	No			
16	9.652608	8.433597	UBE Makabun	Makabun kadarko, Kagoro	KDPA1912043120	1976	13	6	2	2	2	0	0	12	2	3	41	43	36	40	36	37	38	35	37	40	36	41	8	No	Borehole	Yes	No	4	No				
18	9.637881	8.428858	LGEA Kadarko	Adjacent ECWA Church Kadarko, Kag	KDPA1912031120	1949	12	9	0	1	0	1	0	2	11	0	6	50	47	40	46	40	49	50	40	40	45	30	39	8	Yes	No	Yes	No	4	No			
21	9.617889	8.419064	UBE Dusiai Gida	Dusiai Gida, Kagoro	KDPA1912094120	2001	7	6	0	0	0	0	0	6	2	1	36	37	0	33	35	37	34	35	32	35	26	28	6	No	No	Yes	Yes	2	No				
23	9.600039	8.336719	LGEA Kukum Daji	Kukum Daji, Kagoro	KDPA1912037120	1947	21	2	0	0	0	0	0	19	0	4	33	38	37	34	36	39	36	33	33	36	34	32	12	Yes	Tap and	Yes	No	0	No				
24	9.587536	8.342939	LGEA Zunuruk	Zunuruk Agban, Kagoro	KDPA1912087120	1976	24	10	0	0	0	0	2	24	4	4	49	45	48	46	46	41	42	45	41	45	41	44	6	No	No	Yes	No	0	No				
25	9.613878	8.341472	LGEA Zakwa	Zakwa Kukum Daji, Kagoro	KDPA1912083120	1974	29	8	1	2	1	2	0	21	7	9	58	59	56	48	57	54	56	53	54	54	53	55	9	No	Borehole	Yes	No	3	No				
26	9.610292	8.344189	LGEA T/Bidam	Kukum Daji, Kagoro	KDPA1912067120	1976	13	10	0	2	2	0	0	14	3	6	57	58	62	53	63	54	63	52	47	51	50	12	No	Well	Yes	No	4	No					
28	9.707092	8.377283	UBE Ung. Ketah	Ungwan Ketah Tum, Kagoro	KDPA1912077120	2000	7	8	0	1	0	1	0	9	3	3	8	44	46	44	44	47	47	47	44	37	43	41	6	No	No	Yes	No	1	No				
29	9.704236	8.377206	LGEA Tum	Tum, Kagoro	KDPA02791	1953	13	9	0	1	0	0	1	14	3	4	57	55	55	57	55	57	55	54	52	50	54	51	7	Yes	No	Yes	No	1	No				
30	9.658072	8.390503	LGEA Mallagum II	Mallagum II, Kagoro	KDPA1912045120	1973	11	10	0	0	0	0	2	14	2	3	52	51	48	49	54	58	48	46	59	57	58	51	10	Yes	No	Yes	No	3	No				
31	9.654342	8.391508	LGEA Mallagum I	Ajacent St. Thomas Cath. Church Mall	KDPA02697	1962	16	6	0	2	1	2	0	11	3	6	36	43	53	44	43	40	40	45	43	44	40	49	58	No	No	Yes	No	0	No				
33	9.657322	8.378828	LGEA, Katanga	Katanga, Kagoro	KDPA1912034130	1993	12	10	1	0	1	0	0	12	0	1	55	49	54	50	50	53	47	47	42	47	45	7	No	Stream	Yes	No	3	No					
35	9.619847	8.408106	LGEA Safio Gida	Safio Gida, Kagoro	KDPA1912057120	1990	20	5	2	1	2	1	0	19	0	5	47	43	45	46	48	49	47	42	40	41	36	37	14	Yes	Tap and	Yes	No	6	No				
44	9.572617	8.448453	UBE Aa Mangang	Aa Mangang Dutse, Kagoro	KDPA1912113120	2000	0	5	0	0	0	0	0	1	1	3	34	29	42	39	32	38	30	29	37	33	25	20	6	No	Borehole	Yes	No	0	No				
45	9.610431	8.398819	LGEA Central Kagoro	Before ECWA School of Health Tech.	KDPA1912022120	1928	23	8	0	0	2	0	0	1	21	1	7	52	44	53	51	40	44	39	30	36	39	26	33	12	No	Tap and	Yes	No	16	No			
46	9.613597	8.392714	LGEA Kadam	Behind St. Joseph Cath. Church, Kada	KDPA19120102120	1947	24	11	1	1	1	1	0	20	1	1	34	36	42	32	41	33	35	40	37	37	30	40	18	No	Borehole	Yes	No	18	No				
49	9.665486	8.509256	LGEA Gizagwai	Gizagwai, Manchok	KDPA1912029120	1962	15	10	0	0	1	5	0	13	3	8	22	23	20	23	20	22	19	23	25	22	27	26	20	No	Borehole	Yes	No	6	No				
51	9.667619	8.466439	LGEA Model Kaura	Opposite LGA Secretariat, Kaura	KDPA1912053120	1949	17	9	1	3	1	3	0	17	1	8	31	30	29	27	25	29	28	25	24	23	22	25	14	Yes	Borehole	Yes	No	6	No				
52	9.659472	8.500928	LGEA Ung. Nka	Ungwa Nka, Kaura	KDPA1912080120	1976	11	6	0	0	1	2	0	9	1	3	31	25	18	6	6	19	25	19	15	18	23	15	6	No	Borehole	Yes	No	12	No				
54	9.629083	8.512447	LGEA Ashim	Ashim, Attakar	KDPA1912018120	1974	8	3	0	0	0	0	2	5	0	1	37	38	34	36	31	35	30	32	29	31	35	28	8	No	Stream	Yes	No	6	No				
56	9.633288	8.532061	LGEA Adu	Adu, Attakar	KDPA02273	1996	3	6	1	1	0	1	1	0	4	0	5	65	61	50	50	49	49	48	49	43	47	38	46	2	No	No	Yes	No	2	No			
59	9.6307	8.563789	LGEA Zangang	Zangang, Attakar	KDPA1912084120	1973	0	7	0	0	1	0	0	5	0	2	39	37	35	38	34	36	29	34	34	31	26	25	7	No	No	Yes	No	6	No				
62	9.645864	8.456969	LGEA Tachera II	Tachera II, Attakar	KDPA1912059120	1976	1	7	2	0	2	0	0	6	1	1	36	35	33	36	33	36	34	35	32	33	31	33	7	No	Stream	Yes	No	4	No				
63	9.648664	8.483514	LGEA Anturung	Opposite St. Brenda Cath. Church Ant	KDPA02270	1942	7	9	2	3	1	3	0	9	1	6	41	43	42	43	40	35	40	42	40	39	28	33	13	Yes	No	Yes	Yes	4	No				
64	9.6403	8.449222	LGEA Tachera I	Opposite Cath. Church Tachera I, Atta	KDPA1912058120	1973	2	8	2	1	2	1	0	1	7	0	2	41	46	38	43	43	37	41	41	39	36	31	30	8	No	Borehole	Yes	No	0	No			
66	9.628369	8.452314	UBE, Tachera G.	Tachera Gida, Attakar	KDPA1912108120	2005	1	5	0	0	0	0	0	3	0	3	25	24	20	19	21	22	23	20	19	18	14	19	4	No	Stream	Yes	No	0	No				
67	9.644097	8.465994	LGEA Assu	Assu, Attakar	KDPA1912019120	1975	4	5	1	1	1	1	0	5	0	4	40	35	38	35	33	35	34	33	35	33	32	32	4	No	Stream	Yes	No	2	No				
68	9.633142	8.490231	UBE Kyalan	Kyalan, Attakar	KDPA1912104120	2006	10	2	0	0	1	0	0	6	1	6	29	28	27	26	28	27	30	29	29	30	28	30	4	No	Stream	Yes	No	0	No				
70	9.642961	8.489731	LGEA Chicham	Chicham, Attakar	KDPA1912024120	1976	7	5	0	0	2	2	0	5	1	6	38	39	35	34	33	38	35	35	31	33	32	34	6	No	Borehole	Yes	No	2	No				
71	9.589128	8.509664	LGEA Marfan	Marfan, Attakar	KDPA1912041120	1977	1	9	0	0	1	0	0	6	0	4	45	34	49	47	40	48	44	41	45	43	44	46	6	No	Stream	Yes	No	2	No				
72	9.63905	8.497761	Model Fada Attakar	Adjacent St. John Cath. Church, Fada	KDPA1912052120	1962	7	9	0	1	3	1	0	12	0	6	48	46	47	45	48	47	40	48	42	45	41	40	12	Yes	Borehole	Yes	Yes	6	No				
73	9.64125	8.557783	UBE, Kwarga	Along Zangan Road, Kwarga, Mancho	KDPA1912119120	2007	3	5	0	0	0	0	0	5	1	1	24	22	26	16	19	25	19	21	15	13	13	10	6	No	Borehole	Yes	No	0	No				
74	9.652136	8.554644	LGEA Zankan	Along Zangan Road, Zankan, Manch	KDPA113303087	1970	5	7	4	2	2	2	0	5	0	3	38	33	37	32	36	34	37	30	23	23	25	23	11	Yes	Borehole	Yes	No	2	No				
75	9.65185	8.537181	UBE I Inu, Bature	Inwon Bature Sakon Gari, Manchok	KDPA19127012	2000	5	7	1	0	1	0	0	1	7	0	4	31	32	26	29	32	30	30	29	31	29	30	6	No	Borehole	Yes	No	4	No				

SOURCE: Author's Analysis, 2014.

## 5 Distribution of Primary Schools with Playground Facilities

FID	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F	T	M	F	HT	S	Ilan	CI	T	T	D	T	MS	FS	C	MS	FS	C	MS	FS	C	MS	FS	C	MS	FS	C	F	L	F	SDW	S	Fa	PG	T	C
0	9.601136	8.389275	UBE Bako Kota	Manyi Ukwon, Kukum Gida, Kagoro	KDP/191209120	2000	19	9	3	1	3	1	0	1	16	1	6	43	43	44	46	48	45	45	41	45	41	43	40	14	No	Borehole	No	Yes	10	No						
1	9.605869	8.383947	Child Friendly In., Kuk	Kukum Gida, Kagoro	KDP/1912023120	1957	22	13	1	2	1	1	1	3	28	1	3	62	58	54	57	52	53	57	84	59	61	50	58	10	Yes	Borehole	No	Yes	3	No						
2	9.599106	8.375194	UPE Kukum Gida	Adjacent ECWA DCC Malah Uyt, Kaku	KDP/1912038120	1976	22	11	0	0	2	0	0	2	24	1	5	30	35	29	31	7	34	37	33	35	39	37	39	40	No	Borehole	No	Yes	2	No						
7	9.589028	8.373728	LGEA Model, Agban	Maraban Agban, Kagoro	KDP/19120500120	1950	33	13	2	2	2	1	1	2	37	3	4	57	59	56	58	53	46	54	57	50	51	43	44	14	Yes	No	Yes	Yes	8	No						
15	9.637406	8.420814	LGEA, Safio Matok	Adjacent ECWA Church Dusai, Kagoro	KDP/2281	1973	14	12	2	2	2	1	1	2	16	2	1	60	50	55	56	56	53	54	54	52	53	42	48	10	Yes	Borehole	No	Yes	3	No						
21	9.617889	8.419064	UBE Dusai Gida	Dusai Gida, Kagoro	KDP/1912094120	2001	7	6	0	0	0	0	0	0	6	2	1	36	37	0	33	35	37	34	35	32	35	26	28	6	No	No	Yes	Yes	2	No						
41	9.618964	8.400556	UBE Manyi Ushui	Manyi Ushui, Kpak, Kagoro	KDP/19121000120	2007	14	2	1	1	1	1	0	1	11	0	4	22	25	27	25	24	25	24	27	22	21	20	21	2	No	No	No	Yes	0	No						
43	9.608325	8.395358	LGEA F. Kagoro	Fada, Kagoro	KDP/1912088120	1943	24	9	2	1	2	1	0	2	21	2	4	26	35	50	51	48	59	52	58	45	57	59	62	11	Yes	Tap	No	Yes	11	No						
63	9.648664	8.483514	LGEA Anturung	Opposite St. Brenda Cath. Church Ant	KDP/62270	1942	7	9	2	3	1	3	0	0	9	1	6	41	43	42	43	40	35	40	42	40	39	28	33	13	Yes	No	Yes	Yes	4	No						
72	9.63905	8.497761	Model Fada Atakar	Adjacent St. John Cath. Church, Fada	KDP/1912052120	1962	7	9	0	1	3	1	0	1	12	0	6	48	46	47	45	48	47	40	48	42	45	41	40	12	Yes	Borehole	Yes	Yes	6	No						
83	9.667967	8.514803	T. S. Model Primary S	Manchok Junction, Manchok	KDP/1912060120	1945	34	21	2	4	2	3	1	3	38	3	2	78	93	94	90	87	98	85	98	89	99	96	87	18	Yes	Borehole	Yes	Yes	10	No						
84	9.708694	8.555856	LGEA Model, Bondon	Bondon, Manchok	KDP/1912051120	1955	4	10	2	1	2	1	0	1	11	0	1	45	48	41	46	50	45	40	45	46	43	40	37	14	No	No	Yes	Yes	4	No						
93	9.702481	8.529553	LGEA Biniki	Along Biniki Road, Biniki, Manchok	KDP/1912020120	1973	12	8	2	1	2	1	0	1	9	1	5	47	48	45	49	40	44	41	45	40	49	56	52	10	Yes	Stream	Yes	Yes	2	No						
95	9.693892	8.509244	LGEA Mahuta	Along Randiam-Mahuta Road, Mahuta	KDP/1912048120	1973	9	13	1	2	1	2	0	1	16	0	3	54	48	48	50	46	47	41	37	38	39	34	36	9	No	Borehole	Yes	Yes	2	No						
98	9.701567	8.507858	LGEA Kajim	Kajim, Along Mahuta Road, Manchok	KDP/1912033120	1973	13	10	1	3	1	3	0	1	14	1	3	43	44	44	45	43	47	41	41	48	44	45	40	7	No	Stream	Yes	Yes	4	No						

**SOURCE: Author's Analysis, 2014.**

## 6. Distribution of Primary Schools with Library Facilities

FID	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F_T	M	F_IT	S	Ian	Cl	T	T_I	T_D	T	MS	FS_C	MS	FS_C	MS_C	FS	MS	FS	MS	FS	MS	FS_C	F_L	F	SOW	S_Fa	PG	T	C	
6	9.575575	8.375433	UBE Adan	Adan Agban, Kagoro	KDPY1912111120	2009	3	8	0	0	0	0	0	7	1	2	35	42	38	40	39	38	57	54	0	0	0	0	2	No	No	No	0	No		
7	9.589028	8.373728	LGEA Model, Agban	Maraban Agban, Kagoro	KDPY19120500120	1950	33	13	2	2	2	1	1	2	37	3	4	57	59	56	58	53	46	54	57	50	51	43	44	14	Yes	No	Yes	Yes	8	No
17	9.650264	8.426992	UBE mafok Gida	Mafok Gida Dusai, Kagoro	KDPY1912030120	2000	13	5	0	0	0	1	0	9	1	6	51	67	45	59	42	56	39	54	33	50	28	48	6	No	No	No	No	0	No	
18	9.637881	8.428858	LGEA Kadarko	Adjacent ECWA Church Kadarko, Kag	KDPY1912031120	1949	12	9	0	1	0	1	0	2	11	0	6	50	47	40	46	40	49	50	40	45	30	39	8	Yes	No	Yes	No	4	No	
19	9.627625	8.428042	UBE Dibab	Dibab Kadarko, Kagoro	KDPY1912055120	2005	7	7	1	0	1	0	1	2	2	0	1	40	35	30	49	49	30	50	30	42	30	38	5	No	No	No	No	0	No	
21	9.617889	8.419064	UBE Dusai Gida	Dusai Gida, Kagoro	KDPY1912094120	2001	7	6	0	0	0	0	0	6	2	1	36	37	0	33	35	37	34	35	32	35	26	28	6	No	No	Yes	Yes	2	No	
22	9.597972	8.329006	LGEA Garaje	Garaje, Kagoro	KDPY19120028120	1993	33	5	1	2	1	2	0	1	29	3	5	46	48	46	42	43	43	38	32	49	44	39	48	6	No	No	No	No	4	No
24	9.587536	8.342939	LGEA Zunuruk	Zunuruk Agban, Kagoro	KDPY0120087120	1976	24	10	0	0	0	0	2	24	4	4	49	45	48	46	46	41	42	45	41	45	41	44	6	No	No	Yes	No	0	No	
27	9.597097	8.355281	UBE Tsokkwai	Tsokkwai Kukum, Kagoro	KDPY1912065120	2000	25	7	1	0	1	0	0	4	25	0	3	44	41	40	43	39	40	36	40	39	36	38	6	No	No	No	No	2	No	
28	9.707092	8.377283	UBE Ung. Ketah	Ungwan Ketah Tum, Kagoro	KDPY1912077120	2000	7	8	0	1	0	1	0	9	3	3	8	44	46	44	44	47	47	47	44	37	43	41	6	No	No	Yes	No	1	No	
29	9.704236	8.377206	LGEA Tum	Tum, Kagoro	KDPY02791	1953	13	9	0	1	0	0	1	0	14	3	4	57	55	55	57	55	57	55	54	50	54	51	7	Yes	No	Yes	No	1	No	
30	9.658072	8.390503	LGEA Mallagum II	Mallagum II, Kagoro	KDPY1912045120	1973	11	10	0	0	0	0	2	14	2	3	52	51	48	49	54	58	48	46	59	57	58	51	10	Yes	No	Yes	No	3	No	
31	9.654342	8.391508	LGEA Mallagum I	Ajacent St. Thomas Cath. Church Mall	KDPY02697	1962	16	6	0	2	1	2	0	1	11	3	6	36	43	53	44	43	40	40	45	43	44	40	49	58	No	No	Yes	No	0	No
32	9.678472	8.390469	UBE M. Gankon	Mallagum I Market Mallagum, Kagoro	KDPY1912099120	2000	13	7	0	0	1	0	0	13	1	6	57	54	51	49	50	54	54	52	56	50	53	49	4	No	No	No	No	2	No	
34	9.617894	8.413733	UBE Fafan	Fafan Kpak, Kagoro	KDPY1912122151	2002	12	4	0	0	0	0	0	13	1	2	40	45	40	41	39	33	32	33	35	37	36	33	4	No	No	No	No	0	No	
37	9.677231	8.412747	LGEA Madamai I	Madamai, Kagoro	KDPY1912039120	1976	2	8	0	0	1	0	0	8	0	2	35	36	37	38	30	24	31	33	27	34	25	26	6	No	No	No	No	0	No	
38	9.678553	8.406325	UBE Madamai II	Madamai, Kagoro	KDPY191208120	2000	0	11	0	0	1	0	0	8	1	2	31	30	30	29	38	37	29	27	40	38	26	27	6	No	No	No	No	0	No	
39	9.632736	8.408628	UBE Sakong	Behind Development Area Kpak, Kago	KDPY1912107120	2006	14	6	1	0	1	0	0	16	0	3	41	42	45	40	40	45	44	40	42	30	31	4	No	No	No	No	2	No		
41	9.618964	8.400556	UBE Manyi Ushui	Manyi Ushui, Kpak, Kagoro	KDPY19121000120	2007	14	2	1	1	1	0	1	11	0	4	22	25	27	25	24	25	24	27	22	21	20	21	2	No	No	No	Yes	0	No	
47	9.663694	8.450319	UBE Gullu Gado	Along Kaura Road Gullu Gado, Kaura	KDPY19121212120	2000	7	17	1	4	1	4	0	15	1	3	24	25	23	27	23	26	21	28	26	29	23	23	4	No	No	No	No	3	No	
55	9.621556	8.551531	UBE Tangang	Tangang, Attakar	KDPY1912061120	2000	3	4	1	0	1	0	0	4	0	2	44	43	43	41	40	42	38	39	36	37	34	35	6	No	No	No	No	0	No	
56	9.633288	8.532061	LGEA Adu	Adu, Attakar	KDPY02273	1996	3	6	1	1	0	1	0	4	0	5	65	61	50	50	49	49	48	49	43	47	38	46	2	No	No	Yes	No	2	No	
57	9.615033	8.566919	LGEA Ung. Ashin	Ungwa Ashin, Attakar	KDPY1912069120	1999	1	8	0	0	0	0	0	5	2	2	37	35	35	32	30	31	30	32	33	30	28	26	2	No	No	No	No	0	No	
59	9.6307	8.563789	LGEA Zangang	Zangang, Attakar	KDPY1912084120	1973	0	7	0	0	1	0	0	5	0	2	39	37	35	38	34	36	29	34	34	31	26	25	7	No	No	Yes	No	6	No	
60	9.623281	8.503747	UBE Uyt Bwayan	Uyt Bwayan, Attakar	KDPY	2011	4	2	0	0	0	0	0	2	0	4	21	19	16	13	12	13	0	0	0	0	0	0	3	No	No	No	No	0	No	
61	9.586089	8.581269	UBE Telak	Telak, Attakar	KDPY1912114120	2010	1	2	0	0	0	0	1	0	0	2	30	39	35	34	22	28	0	0	0	0	0	0	2	No	No	No	No	0	No	
63	9.648664	8.483514	LGEA Anturung	Opposite St. Brenda Cath. Church Ant	KDPY02270	1942	7	9	2	3	1	3	0	9	1	6	41	43	42	43	40	35	40	42	40	39	28	33	13	Yes	No	Yes	Yes	4	No	
79	9.674003	8.506094	LGEA Manchok Centr	Along Jankasa Road, Manchok	KDPY1912046120	1954	22	4	1	2	1	2	0	18	0	1	33	30	38	41	43	41	41	39	38	39	38	48	3	No	No	No	No	0	No	
80	9.662658	8.522217	UBE Ung. Boye	Ung. Boye, Manchok	KDPY1912071120	2000	9	8	0	0	0	0	1	8	0	6	41	43	34	32	31	30	30	36	31	30	31	30	4	No	No	No	No	0	No	
82	9.654847	8.522647	LGEA Manchok Tash	Manchok Tasha, Manchok	KDPY1912047120	1974	16	8	0	1	0	0	1	16	0	0	40	35	43	44	42	40	47	48	45	46	44	45	8	No	No	Yes	No	4	No	
84	9.708694	8.555656	LGEA Model, Bondon	Bondon, Manchok	KDPY1912051120	1955	4	10	2	1	2	1	0	11	0	1	45	48	41	46	50	45	40	45	46	43	40	37	14	No	No	Yes	Yes	4	No	
85	9.695247	8.585331	UBE, Akuku	Akuku, Bondon, Manchok	KDPY1912103120	2000	1	3	0	0	0	0	0	3	0	3	37	31	35	29	35	33	30	27	28	26	27	25	5	No	No	No	No	2	No	
86	9.711128	8.5731	UBE Me-Kakpang	Opposite C.K.C. Me-Kakpang, Mancho	KDPY1912011120	2007	4	1	0	0	0	0	0	3	1	1	21	25	18	18	24	23	20	22	19	20	19	19	6	No	No	Yes	No	0	No	
87	9.704086	8.587606	LGEA Ung. Kurah	Ungwan Kurah, Bondon, Manchok	KDPY1912079120	1999	0	8	0	1	0	1	0	2	0	5	36	39	33	37	34	28	29	30	25	32	31	33	4	No	No	Yes	No	2	No	
88	9.698807	8.477286	LGEA Uru Gata	Ungwan Gata Bondon, Manchok	KDPY1912079120	1976	5	5	0	0	0	0	0	0	1	0	20	21	26	20	20	20	21	28	26	26	25	24	4	No	No	No	No	0	No	
94	9.689875	8.509939	LGEA Randiam	Along Randiam Road, Randiam, Mancho	KDPY1912056120	1976	4	12	0	0	2	2	0	5	0	5	39	40	34	37	46	41	40	42	46	40	58	44	7	Yes	No	Yes	No	4	No	
102	9.694861	8.553667	UBE Hayin Gora	Hayin Gora, Matuak, Manchok	KDPY1912098120	2000	4	6	1	2	1	2	0	1	2	0	5	40	45	45	42	44	43	40	39	35	40	31	27	6	No	No	Yes	No	2	No

SOURCE: Author's Analysis, 2014.

## 7. Distribution of Primary Schools with Computer Laboratories

FID	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F	T	M	F	JIT	S	Ilan	Cl	T	T	M	T	D	T	MS	FS_C	MS	FS_C	MS	FS_C	MS	FS_C	MS	FS_C	F	L	F	SDW	S	Fa	PG	T	C
0	9.601136	8.389275	UBE Bako Kofa	Manyi Ukwon, Kukum Gida, Kagoro	KDP/191209120	2000	19	9	3	1	3	1	0	1	16	1	6	43	43	44	46	48	45	45	41	45	41	43	40	14	No	Borehole	No	Yes	10	No			
1	9.605869	8.383947	Child Friendly In., Kuk	Kukum Gida, Kagoro	KDP/1912023120	1957	22	13	1	2	1	1	1	3	28	1	3	62	58	54	57	52	53	57	84	59	61	50	58	10	Yes	Borehole	No	Yes	3	No			
2	9.599106	8.375194	UPE Kukum Gida	Adjacent ECWA DCC Matah Uyit, Kaku	KDP/1912038120	1976	22	11	0	0	2	0	0	2	24	1	5	30	35	29	31	7	34	37	33	35	39	37	39	40	No	Borehole	No	Yes	2	No			
3	9.573689	8.364894	LGEA Tsonje I	Tsonje, Agban, Kagoro	KDP/1912064120	1976	12	9	0	0	0	0	0	2	12	0	6	45	47	44	46	45	43	41	47	41	43	42	49	6	No	Stream	No	No	3	No			
4	9.595542	8.384436	UBE Agban Gida	Agban Gida, Kagoro	KDP/19120151120	2000	18	8	0	0	1	1	0	0	17	1	8	40	39	40	40	44	40	50	45	52	40	50	44	4	No	Borehole	No	No	1	No			
5	9.587889	8.379164	UBE Uzah Agban	Uzah Agban, Kagoro	KDP/1912115120	2009	8	4	0	1	0	1	0	1	6	0	5	37	39	36	38	33	35	31	34	0	0	0	2	No	Well	No	No	2	No				
6	9.575575	8.375433	UBE Adan	Adan Agban, Kagoro	KDP/1912111120	2009	3	8	0	0	0	0	0	0	7	1	2	35	42	38	40	39	38	57	54	0	0	0	2	No	No	No	No	0	No				
7	9.599028	8.373728	LGEA Model, Agban	Maraban Agban, Kagoro	KDP/19120500120	1950	33	13	2	2	2	1	1	2	37	3	4	57	59	56	58	53	46	54	57	50	51	43	44	14	Yes	No	Yes	Yes	8	No			
8	9.577994	8.368058	UBE Tsonje II	Tsonje, Agban, Kagoro	KDP/1912063120	2000	12	9	0	0	0	0	0	1	11	2	6	30	37	36	39	40	36	37	40	40	33	31	40	5	No	Borehole	No	No	4	No			
9	9.637519	8.356617	LGEA Fadan Daji	Fadan Daji, Kagoro	KDP/1912027120	1974	3	7	0	0	2	0	0	1	6	0	3	40	43	43	48	46	47	40	43	40	41	32	38	10	No	Borehole	No	No	6	No			
10	9.651806	8.370917	LGEA Ung. Rami	Ungwa Rami, Kagoro	KDP/1912081120	1976	5	12	0	0	1	0	0	2	13	0	1	42	49	38	39	33	36	33	37	34	34	34	30	6	No	Borehole	No	No	6	No			
11	9.627464	8.375067	UBE Zankam	Zankam, Kagoro	KDP/1912118120	2000	4	7	0	0	1	0	0	0	7	0	2	22	21	35	34	25	20	31	20	23	27	23	20	6	No	Stream	No	No	0	No			
12	9.641358	8.354467	UBE Jankasa	Jankasa, Kagoro	KDP/191097120	2000	1	4	0	0	0	0	0	0	3	0	2	20	34	23	32	24	26	25	32	19	29	23	35	7	No	Stream	No	No	0	No			
13	9.620386	8.384794	UBE Tuyit	Tuyit, Kagoro	KDP/1912114120	2000	15	1	0	0	1	1	0	0	11	0	5	14	28	36	40	37	36	36	36	36	36	34	37	2	No	Borehole	No	No	3	No			
14	9.633864	8.350856	UBE Koduak	Koduak F.Daji, Kagoro	KDP/	2011	2	2	0	0	0	0	0	0	2	0	2	26	23	30	20	35	23	0	0	0	0	0	3	No	Stream	No	No	0	No				
15	9.637406	8.420814	LGEA, Satio Marok	Adjacent ECWA Church Dusai, Kagoro	KDP/2281	1973	14	12	2	2	2	1	1	2	16	2	1	60	50	55	56	56	53	54	54	52	53	42	48	10	Yes	Borehole	No	Yes	3	No			
16	9.652608	8.433597	UBE Makabun	Makabun Kadarko, Kagoro	KDP/1912043120	1976	13	6	2	2	2	2	0	0	12	2	3	41	43	36	40	36	37	38	35	37	40	36	41	8	No	Borehole	Yes	No	4	No			
17	9.650264	8.426992	UBE mafok Gida	Mafok Gida Dusai, Kagoro	KDP/1912030120	2000	13	5	0	0	0	1	0	0	9	1	6	51	67	45	59	42	56	39	54	33	50	28	48	6	No	No	No	No	0	No			
18	9.637881	8.428858	LGEA Kadarko	Adjacent ECWA Church Kadarko, Kag	KDP/1912031120	1949	12	9	0	1	0	1	0	2	11	0	6	50	47	40	46	40	49	50	40	40	45	30	39	8	Yes	No	Yes	No	4	No			
19	9.627625	8.428042	UBE Dibab	Dibab Kadarko, Kagoro	KDP/1912055120	2005	7	7	1	0	1	0	1	2	2	0	1	40	35	30	49	49	30	50	30	33	42	30	38	5	No	No	No	No	0	No			
20	9.652533	8.433964	LGEA Kadarko Gida	Kadarko Gida, Kagoro	KDP/1912030120	1999	8	5	0	0	1	1	0	1	7	1	3	29	44	45	35	35	49	40	48	40	50	40	7	8	No	Borehole	No	No	2	No			
21	9.617889	8.419064	UBE Dusai Gida	Dusai Gida, Kagoro	KDP/1912094120	2001	7	6	0	0	0	0	0	0	6	2	1	36	37	0	33	35	37	34	35	32	35	26	28	6	No	No	Yes	Yes	2	No			
22	9.597972	8.329006	LGEA Garaje	Garaje, Kagoro	KDP/19120028120	1993	33	5	1	2	1	2	0	1	29	3	5	46	48	46	42	43	43	38	32	49	44	39	48	6	No	No	No	No	4	No			
23	9.600039	8.336719	LGEA Kukum Daji	Kukum Daji, Kagoro	KDP/1912037120	1947	21	2	0	0	0	0	0	0	19	0	4	33	38	37	34	36	39	36	33	33	36	34	32	12	Yes	Tap and	Yes	No	0	No			
24	9.587536	8.342939	LGEA Zunuruk	Zunuruk Agban, Kagoro	KDP/1012087120	1976	24	10	0	0	0	0	0	2	24	4	4	49	45	48	46	46	41	42	45	41	45	41	44	6	No	No	Yes	No	0	No			
25	9.613878	8.341472	LGEA Zakwa	Zakwa Kukum Daji, Kagoro	KDP/1912083120	1974	29	8	1	2	1	2	0	0	21	7	9	58	59	56	48	57	54	56	53	54	54	53	55	9	No	Borehole	Yes	No	3	No			
26	9.610292	8.344189	LGEA T/Bidan	Kukum Daji, Kagoro	KDP/1912067120	1976	13	10	0	2	2	2	0	0	14	3	6	57	58	62	53	63	54	63	52	47	47	51	50	12	No	Well	Yes	No	4	No			
27	9.597097	8.355281	UBE Tsokkwai	Tsokkwai Kukum, Kagoro	KDP/1912065120	2000	25	7	1	0	1	0	0	4	25	0	3	44	41	40	43	39	40	36	40	40	39	36	38	6	No	No	No	No	2	No			
28	9.707092	8.377263	UBE Ung. Ketah	Ungwan Ketah Tum, Kagoro	KDP/1912077120	2000	7	8	0	1	0	1	0	0	9	3	3	8	44	46	44	44	47	47	47	44	37	43	41	6	No	No	Yes	No	1	No			
29	9.704236	8.377206	LGEA Tum	Tum, Kagoro	KDP/02791	1953	13	9	0	1	0	0	1	0	14	3	4	57	55	55	57	55	57	55	54	52	50	54	51	7	Yes	No	Yes	No	1	No			
30	9.658072	8.390503	LGEA Mallagum II	Mallagum II, Kagoro	KDP/1912045120	1973	11	10	0	0	0	0	0	2	14	2	3	52	51	48	49	54	58	48	46	59	57	58	51	10	Yes	No	Yes	No	3	No			
31	9.654342	8.391508	LGEA Mallagum I	Ajacent St. Thomas Cath. Church Mall	KDP/02697	1962	16	6	0	2	1	2	0	1	11	3	6	36	43	53	44	43	40	40	45	43	44	40	49	58	No	No	Yes	No	0	No			
32	9.676472	8.390469	UBE M. Gankon	Mallagum I Market Mallagum, Kagoro	KDP/1912099120	2000	13	7	0	0	1	0	0	0	13	1	6	57	54	51	49	50	54	54	52	56	50	53	49	4	No	No	No	No	2	No			
33	9.657322	8.378828	LGEA, Katanga	Katanga, Kagoro	KDP/1912034130	1993	12	10	1	0	1	0	0	0	12	0	1	55	49	54	50	50	53	47	47	47	42	47	45	7	No	Stream	Yes	No	3	No			
34	9.617894	8.413733	URF Fatan	Fatan Knak Kagoro	KDP/1912122151	2002	12	4	0	0	0	0	0	0	13	1	2	40	45	40	41	39	33	32	33	35	37	36	33	4	No	No	No	No	0	No			

**SOURCE: Author's Analysis**

FID	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F	T	M	F	HT	S	Ilan	CI	T	T	NT	D	T	MS	FS	C	MS	FS	C	MS	FS	C	MS	FS	C	MS	FS	C	F	L	F	SDW	S	Fa	PG	T	C
35	9.619847	8.408106	LGEA Safio Gida	Safio Gida, Kagoro	KDP/1912057120	1990	20	5	2	1	2	1	0	1	19	0	5	47	43	45	46	48	49	47	42	40	41	36	37	14	Yes	Tap and	Yes	No	6	No							
36	9.632956	8.395589	LGEA Kpak	After Turaki Buga Mem. Hospital Kpak,	KDP/1912036120	1967	13	4	0	0	2	1	0	0	17	1	0	40	59	59	43	42	62	52	50	37	39	38	36	7	Yes	Borehole	No	No	3	No							
37	9.677231	8.412747	LGEA Madamai I	Madamai, Kagoro	KDP/1912039120	1976	2	8	0	0	1	0	0	0	8	0	2	35	36	37	38	30	24	31	33	27	34	25	26	6	No	No	No	No	0	No							
38	9.676553	8.406325	UBE Madamai II	Madamai, Kagoro	KDP/191208120	2000	0	11	0	0	1	0	0	0	8	1	2	31	30	30	29	38	37	29	27	40	38	26	27	6	No	No	No	No	0	No							
39	9.632736	8.408628	UBE Sakong	Behind Development Area Kpak, Kago	KDP/1912107120	2006	14	6	1	0	1	0	0	0	16	0	3	41	42	45	40	40	45	44	40	40	42	30	31	4	No	No	No	No	2	No							
40	9.608772	8.402969	UBE Uzah Kpak	Uzah Kpak(Water Board Area), Kago	KDP/1912116120	2007	13	2	0	0	0	1	0	0	11	0	4	35	36	36	39	32	29	25	28	21	24	20	23	8	No	Tap	No	No	10	No							
41	9.618964	8.400556	UBE Manyi Ushui	Manyi Ushui, Kpak, Kagoro	KDP/19121000120	2007	14	2	1	1	1	1	0	1	11	0	4	22	25	27	25	24	25	24	27	22	21	20	21	2	No	No	No	Yes	0	No							
42	9.577278	8.437756	LGEA Duste	Dutse (Hill), Kagoro	KDP/1912026120	1976	0	9	0	0	0	0	0	0	7	1	1	36	35	29	40	30	40	36	30	30	28	30	29	4	No	Stream	No	No	2	No							
43	9.608325	8.395358	LGEA F. Kagoro	Fada, Kagoro	KDP/1912088120	1943	24	9	2	1	2	1	0	2	21	2	4	26	35	50	51	48	59	52	58	45	57	59	62	11	Yes	Tap	No	Yes	11	No							
44	9.572617	8.448453	UBE Aa Mangang	Aa Mangan Dutse, Kagoro	KDP/1912113120	2000	0	5	0	0	0	0	0	0	1	1	3	34	29	42	39	32	38	30	29	37	33	25	20	6	No	Borehole	Yes	No	0	No							
45	9.610431	8.398819	LGEA Central Kagoro	Before ECWA School of Health Tech.,	KDP/1912022120	1928	23	8	0	0	2	0	0	1	21	1	7	52	44	53	51	40	44	39	30	36	39	26	33	14	No	Tap and	Yes	No	16	No							
46	9.613597	8.392714	LGEA Kadau	Behind St. Joseph Cath. Church, Kada	KDP/19120102120	1947	24	11	1	1	1	1	0	0	20	1	1	34	36	42	32	41	33	35	40	37	37	30	40	18	No	Borehole	Yes	No	18	No							
47	9.663594	8.450319	UBE Gullu Gado	Along Kaura Road Gullu Gado, Kaura	KDP/1912112120	2000	7	17	1	4	1	4	0	1	15	1	3	24	25	23	27	23	26	21	28	26	29	23	23	4	No	No	No	No	3	No							
48	9.65936	8.469897	UBE Gayansa	Gayansa, Kaura	KDP/1912095120	2000	11	7	1	2	1	2	0	0	7	0	6	24	25	23	26	23	24	21	17	20	19	22	16	2	No	Borehole	No	No	6	No							
49	9.665486	8.509256	LGEA Gizagwai	Gizagwai, Manchok	KDP/1912029120	1962	15	10	0	0	1	5	0	1	13	3	8	22	23	20	23	20	22	19	23	25	22	27	26	20	No	Borehole	Yes	No	6	No							
50	9.668864	8.453736	LGEA Ung. Abagai	Ungwa Abagai, Kaura	KDP/1912068120	1991	7	7	0	0	1	0	0	1	8	0	3	20	21	16	24	17	22	15	18	9	21	17	17	4	No	Borehole	No	No	3	No							
51	9.667619	8.468439	LGEA Model Kaura	Opposite LGA Secretariat, Kaura	KDP/1912053120	1949	17	9	1	3	1	3	0	1	17	1	8	31	30	29	27	25	29	28	25	24	23	22	25	14	Yes	Borehole	Yes	No	6	No							
52	9.659472	8.500928	LGEA Ung. Nka	Ungwa Nka, Kaura	KDP/1912080120	1976	11	6	0	0	1	2	0	2	9	1	3	31	25	18	6	6	19	25	19	15	18	23	15	6	No	Borehole	Yes	No	12	No							
53	9.629292	8.505325	LGEA Model Mifi	Mifi, Attakar	KDP/1912049120	1976	6	8	0	0	1	1	0	0	12	0	2	48	48	45	45	44	43	44	42	43	41	40	39	8	No	Borehole	No	No	3	No							
54	9.629083	8.512447	LGEA Ashim	Ashim, Attakar	KDP/1912018120	1974	8	3	0	0	0	0	0	2	5	0	1	37	38	34	36	31	35	30	32	29	31	35	28	8	No	Stream	Yes	No	6	No							
55	9.621556	8.551531	UBE Tangang	Tangang, Attakar	KDP/1912061120	2000	3	4	1	0	1	0	0	0	4	0	2	44	43	43	41	40	42	38	39	36	37	34	35	6	No	No	No	No	0	No							
56	9.633288	8.532061	LGEA Adu	Adu, Attakar	KDP/02273	1996	3	6	1	1	0	1	1	0	4	0	5	65	61	50	50	49	49	48	49	43	47	38	46	2	No	No	Yes	No	2	No							
57	9.615033	8.566919	LGEA Ung. Ashin	Ungwa Ashin, Attakar	KDP/1912069120	1999	1	8	0	0	0	0	0	0	5	2	2	37	35	35	32	30	31	30	32	33	30	28	26	2	No	No	No	No	0	No							
58	9.587789	8.538942	LGEA Zilan	Zilan, Attakar	KDP/1912086120	1993	0	8	0	0	1	0	0	0	6	0	2	44	46	42	45	40	38	41	40	40	43	38	34	4	No	Stream	No	No	0	No							
59	9.6307	8.563789	LGEA Zangang	Zangang, Attakar	KDP/1912084120	1973	0	7	0	0	1	0	0	0	5	0	2	39	37	35	38	34	36	29	34	34	31	26	25	7	No	No	Yes	No	6	No							
60	9.623281	8.503747	UBE Uyi Bwayan	Uyi Bwayan, Attakar	KDP/	2011	4	2	0	0	0	0	0	0	2	0	4	21	19	16	13	12	13	0	0	0	0	0	0	3	No	No	No	No	0	No							
61	9.586089	8.581269	UBE Telak	Telak, Attakar	KDP/1912114120	2010	1	2	0	0	0	0	0	1	0	0	2	30	39	35	34	22	28	0	0	0	0	0	0	2	No	No	No	No	0	No							
62	9.645864	8.458969	LGEA Tachera II	Tachera II, Attakar	KDP/1912059120	1976	1	7	2	0	2	0	0	0	6	1	1	36	35	33	36	33	36	34	35	32	33	31	33	7	No	Stream	Yes	No	4	No							
63	9.648664	8.483514	LGEA Anturung	Opposite St. Brenda Cath. Church Ant	KDP/02270	1942	7	9	2	3	1	3	0	0	9	1	6	41	43	42	43	40	35	40	42	40	39	28	33	13	Yes	No	Yes	Yes	4	No							
64	9.6403	8.449222	LGEA Tachera I	Opposite Cath. Church Tachera I, Atta	KDP/1912058120	1973	2	8	2	1	2	1	0	1	7	0	2	41	46	38	43	43	37	41	41	39	36	31	30	8	No	Borehole	Yes	No	0	No							
65	9.630575	8.445208	UBE Akullau Mem.	Tachera I, Attakar	KDP/1912110120	2009	3	4	0	0	0	0	0	0	5	0	2	28	30	29	29	28	26	23	24	24	24	0	0	6	No	Stream	No	No	0	No							
66	9.628369	8.452314	UBE Tachera G.	Tachera Gida, Attakar	KDP/1912108120	2005	1	5	0	0	0	0	0	0	3	0	3	25	24	20	19	21	22	23	20	19	18	14	19	4	No	Stream	Yes	No	0	No							
67	9.644097	8.465994	LGEA Assu	Assu, Attakar	KDP/1912019120	1975	4	5	1	1	1	1	0	0	5	0	4	40	35	38	35	33	35	34	33	35	33	32	32	4	No	Stream	Yes	No	2	No							
68	9.633142	8.490231	UBE Kyalan	Kyalan, Attakar	KDP/1912104120	2006	10	2	0	0	0	1	0	0	6	1	6	29	28	27	26	28	27	30	29	29	30	28	30	4	No	Stream	Yes	No	0	No							
69	9.631619	8.478378	UBE Inn Kaehevin	Innwa Kaehevin, Attakar	KDP/1912075120	2000	3	8	0	0	2	1	0	0	4	1	3	33	31	31	30	33	31	32	30	30	32	27	30	6	No	Stream	No	No	0	No							

**SOURCE: Author's Analysis**

FID	Ylat	Xlon	School_Nam	School_Add	Sch_Code	Est_Y	F	T	M	F	IT	S	Ilan	Cl	T	I	T	D	T	MS	FS_C	MS	FS_C	MS_C	FS	MS	FS	MS	FS_C	F	L	F	SDW	S_Fa	PG	T	C_
70	9.642961	8.489731	LGEA Chicham	Chicham, Attakar	KDP1912024120	1976	7	5	0	0	2	2	0	0	5	1	6	38	39	35	34	33	38	35	35	31	33	32	34	6	No	Borehole	Yes	No	2	No	
71	9.589128	8.509664	LGEA Mafan	Mafan, Attakar	KDP1912041120	1977	1	9	0	0	1	0	0	0	6	0	4	45	34	49	47	40	48	44	41	45	43	44	46	6	No	Stream	Yes	No	2	No	
72	9.63905	8.497761	Model Fada Attakar	Adjacent St. John Cath. Church, Fada	KDP1912052120	1962	7	9	0	1	3	1	0	1	12	0	6	48	46	47	45	48	47	40	48	42	45	41	40	12	Yes	Borehole	Yes	Yes	6	No	
73	9.64125	8.527783	UBE, KIWARGA	Along Zangan Road, KIWARGA, Mancho	KDP1912119120	2007	3	5	0	0	0	0	0	0	5	1	1	24	22	26	16	19	25	19	21	15	13	13	10	6	No	Borehole	Yes	No	0	No	
74	9.652136	8.554644	LGEA Zankan	Along Zangang Road, Zankan, Manchok	KDP113303087	1970	5	7	4	2	2	2	0	0	5	0	3	38	33	37	32	36	34	37	30	23	23	25	23	11	Yes	Borehole	Yes	No	2	No	
75	9.65185	8.527181	UBE, Ung. Bature	Ungwan Bature, Sabon Gari, Manchok	KDP19127012	2000	5	7	1	0	1	0	0	1	7	0	4	31	32	26	29	32	30	30	32	29	31	29	30	6	No	Borehole	Yes	No	4	No	
76	9.678561	8.547497	LGEA Bungen	Bungen, Manchok	KDP1912021120	1976	2	7	1	0	1	0	0	0	5	1	3	36	35	43	38	47	43	43	43	34	30	29	20	6	No	Well	Yes	No	0	No	
77	9.659058	8.546997	LGEA Ung. Goni	Ungwan Goni, Manchok	KDP8302893	1993	5	6	0	2	0	2	0	0	4	0	4	43	40	41	42	39	42	42	40	42	41	33	4	No	Borehole	Yes	No	0	No		
78	9.663631	8.524242	LGEA Ung. Kajit	Ungwan Kajit, Manchok	KDP1912074120	1976	20	4	1	2	1	2	0	0	10	3	6	42	35	49	47	48	47	42	41	47	45	43	41	6	No	Borehole	No	No	2	No	
79	9.674003	8.508094	LGEA Manchok Cent	Along Jankasa Road, Manchok	KDP1912046120	1954	22	4	1	2	1	2	0	0	18	0	1	33	30	38	41	43	41	41	39	38	39	38	48	3	No	No	No	No	0	No	
80	9.662658	8.522217	UBE Ung. Boye	Ung. Boye, Manchok	KDP1912071120	2000	9	8	0	0	0	0	0	1	8	0	6	41	43	34	32	31	30	30	36	31	30	31	30	4	No	No	No	No	0	No	
81	9.660311	8.51205	UBE Ung. Kukhat	Ungwa Kukhat, Manchok	KDP1912078120	2000	7	4	2	1	2	1	0	0	7	0	2	38	35	43	40	35	34	37	40	31	30	38	39	8	No	Borehole	Yes	No	4	No	
82	9.654847	8.522647	LGEA Manchok Tesh	Manchok Tasha, Manchok	KDP1912047120	1974	16	8	0	1	0	0	1	1	16	0	0	40	35	43	44	42	40	47	48	45	46	44	45	8	No	No	Yes	No	4	No	
83	9.667967	8.514803	T. S. Model Primary S	Manchok Junction, Manchok	KDP1912060120	1945	34	21	2	4	2	3	1	3	38	3	2	78	93	94	90	87	98	85	98	99	96	87	18	Yes	Borehole	Yes	Yes	10	No		
84	9.708694	8.555656	LGEA Model, Bondon	Bondon, Manchok	KDP1912051120	1955	4	10	2	1	2	1	0	1	11	0	1	45	48	41	46	50	45	40	45	46	43	40	37	14	No	No	Yes	Yes	4	No	
85	9.695247	8.585331	UBE, Akuku	Akuku, Bondon, Manchok	KDP1912103120	2000	1	3	0	0	0	0	0	0	3	0	3	37	31	35	29	35	33	30	27	28	26	27	25	5	No	No	No	No	2	No	
86	9.711128	8.5731	UBE Me-Kakpang	Opposite C.K.C. Me-Kakpang, Mancho	KDP191201120	2007	4	1	0	0	0	0	0	0	3	1	1	21	25	18	18	24	23	20	22	19	20	19	19	6	No	No	Yes	No	0	No	
87	9.704086	8.587606	LGEA Ung. Kurah	Ungwan Kurah, Bondon, Manchok	KDP1912079120	1999	0	8	0	1	0	1	0	0	2	0	5	36	39	33	37	34	28	29	30	25	32	31	33	4	No	No	Yes	No	2	No	
88	9.688892	8.572286	LGEA Ung. Gata	Ungwan Gata, Bondon, Manchok	KDP1912072120	1976	5	5	0	0	0	0	0	0	9	1	0	29	31	26	29	30	32	31	28	26	28	25	24	4	No	No	No	No	0	No	
89	9.728889	8.530972	LGEA Ung. Kaya	Ungwan Kaya, Binki, Manchok	KDP1912076120	1975	5	7	1	0	1	0	0	1	5	0	4	32	35	37	36	31	33	34	34	30	33	39	30	4	No	Stream	No	No	0	No	
90	9.714883	8.528789	UBE, Apioh Kurah	Apioh Kurah, Binki, Manchok	KDP191269012	2007	3	4	0	2	0	2	0	0	2	0	3	35	33	30	27	30	32	27	26	21	28	21	24	2	No	Borehole	No	No	0	No	
91	9.734282	8.521397	LGEA, Ung. Shemang	Ungwan Shemang, Binki, Manchok	KDP1912082120	1976	0	7	1	0	1	0	0	0	5	0	2	37	39	35	36	37	36	34	37	32	30	31	32	4	No	Stream	No	No	0	No	
92	9.723106	8.515264	UBE Tsuami Chitta	Tsuami Chitta, Binki, Manchok	KDP1912062120	2000	7	7	0	0	0	0	0	4	0	3	33	34	32	31	30	31	29	28	23	28	20	19	2	No	Stream	Yes	No	0	No		
93	9.702481	8.529553	LGEA Binki	Along Binki Road, Binki, Manchok	KDP1912020120	1973	12	8	2	1	2	1	0	1	9	1	5	47	48	45	49	40	44	41	45	40	49	56	52	10	Yes	Stream	Yes	Yes	2	No	
94	9.689875	8.509839	LGEA Randiam	Along Randiam Road, Randiam, Manchok	KDP1912056120	1976	4	12	0	0	2	2	0	0	5	0	5	39	40	34	37	46	41	40	42	46	40	58	44	7	Yes	No	Yes	No	4	No	
95	9.693892	8.509244	LGEA Mahuta	Along Randiam-Mahuta Road, Mahuta,	KDP1912048120	1973	9	13	1	2	1	2	0	1	16	0	3	54	48	48	50	46	47	41	37	38	39	34	36	9	No	Borehole	Yes	Yes	2	No	
96	9.701587	8.507858	UBE Abuka	Abuka, Manchok	KDP10485	2000	5	11	2	1	2	1	0	2	6	1	4	40	41	36	33	37	39	42	40	32	34	32	36	6	No	Borehole	Yes	No	2	No	
97	9.675486	8.509789	UBE Zwahu K. Mem.	Manchok	KDP1920020	2000	18	6	0	2	0	1	1	0	15	2	6	37	38	34	35	33	32	33	32	29	31	30	29	4	No	Borehole	Yes	No	0	No	
98	9.701587	8.507858	LGEA Kajin	Kajin, Along Mahuta Road, Manchok	KDP1912033120	1973	13	10	1	3	1	3	0	1	14	1	3	43	44	44	45	43	47	41	41	48	44	45	40	7	No	Stream	Yes	Yes	4	No	
99	9.728158	8.563356	LGEA Bondong Cent.	Bondon, Manchok	KDP1912121121	1959	6	4	0	2	0	2	0	1	6	1	2	42	44	42	45	44	46	47	46	42	43	39	37	7	Yes	Borehole	Yes	No	2	No	
100	9.718414	8.544956	LGEA Matuak	Matuak, Manchok	KDP1912048120	1973	7	10	2	2	2	2	0	0	7	2	8	44	45	43	42	47	42	42	45	42	49	40	43	6	No	Borehole	Yes	No	2	No	
101	9.740939	8.5638	UBE Chikka	Adjacent Cath. Church, Chikka, Manchok	KDP1912093120	2000	1	7	1	2	1	2	0	0	5	0	3	45	40	43	41	44	40	42	49	48	43	40	35	6	No	Stream	Yes	No	0	No	
102	9.694861	8.553667	UBE Hayin Gora	Hayin Gora, Matuak, Manchok	KDP1912096120	2000	4	6	1	2	1	2	0	1	2	0	5	40	45	45	42	44	43	40	39	35	40	31	27	6	No	No	Yes	No	2	No	
103	9.697564	8.556147	UBE Me-Sankwai	Me-Sankwai, Matuak, Manchok	KDP1912102120	2007	6	4	0	0	0	1	0	0	7	1	2	30	33	38	37	36	34	35	31	32	28	28	29	4	No	Stream	Yes	No	0	No	

**SOURCE: Author's Analysis**