SPATIO-FUNCTIONAL ANALYSIS OF EDUCATION AND HEALTH IN KARBI ANGLONG DISTRICT, ASSAM: A GEOGRAPHICAL APPROACH

Thesis Submitted to Nagaland University in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY (Ph.D)
IN
GEOGRAPHY

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21st MARCH, 2022

DECLARATION

I do hereby declare that this thesis entitled **"Spatio-Functional Analysis of Education and Health in Karbi Anglong District, Assam: A Geographical Approach"** is an original work carried out by me in partial fulfillment of the requirements for the award of Degree of Doctor of Philosophy (Ph.D) in Geography under the able guidance and Supervision of Prof. T. Sangyu Yaden, Department of Geography, School of Sciences, Nagaland University, Lumami and it has not been submitted previously in part or in full elsewhere for the award of any other Degree or Diploma courses of any University in India and abroad.

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CERTIFICATE

This is to certify that the thesis entitled **"Spatio-Functional Analysis of Education and Health in Karbi Anglong District, Assam: A Geographical Approach"** submitted to the Nagaland University in partial fulfillment of the requirements for the degree of Doctor of Philosophy (Ph.D.) in Geography, embodies the original research work carried out by Mr. Binud Mochahari, Registration Number 641/2015, under my supervision and guidance.

Further, I certify that no part of this thesis has been submitted anywhere for any other research degree. The assistance and help received during the course of study have been duly acknowledged.

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Date: 21st March, 2022 **Binud Mochahari**

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CHAPTER – I

INTRODUCTION

CHAPTER-I

INTRODUCTION

In the areas of developing economy of the country, like India, it is being observed that, the distribution of infrastructural facilities for development is not performed efficiently. It may be either due to lack of facilities available and its low level of performances or because of their areal imbalances and accessibility. In many studies, it has therefore been highlighted that there is a primacy in the distribution of functions and facilities as well. It is also being observed that the development processes are operated through utilizing the availability of local resource phenomena. There is also an ample need of extension and expansion of the related functions and facilities. The failure of 'trickle down mechanism' of spatial system disturbs 'size-ratchet sequence', evolves duality in space economy and creates problem of rural to urban migration and primacy in the distribution of functional gathering. Consequently, growth and stagnation polarize and economic system remains unarticulated. Thus, empirical testing of production processes of the study area, location processes of spatio-functional activities, decentralization of functions are the necessary criteria that must be looked into at the time of analyzing the spatio-functional facilities. There is a need therefore to examine the spatial patterns of the socio-economic activities, their efficiencies/deficiencies in the area and its proper spatio-functional facilities. Further, the spatio-functional facilities and its parametric components that are related to the general distribution of functions/facilities, its densities and intensities for rural area must be analyzed in detail particularly in the backward economy of the region.

1.1 CONCEPTUAL BACKGROUND

It is widely accepted that, the development of any area or region is mainly recognized by well-formed of location structure of the functions/facilities, its magnitude and intensities. In the spatial context, the task of regional planning in a country like India, is almost essential, in view of the ecological differences from area to area (Wanmali 1972). Planning processes have been widely accepted to promote the well-being of the area and the people. They emphasize maximum of the developmental activities, in a particular region/area, in terms of spatio-functional interactional system

with transformation and modification of socio-economic facilities, so that the gaps may be identified and filled up.

The spatio-functional facilities in its broader sense refer to distributive aspects of socio-economic facilities or functional activities in spatial context. It takes into account the magnitude as well as hierarchy of functions and is often termed as 'Central functions'. These are generally non-ubiquitous in nature because of technological, economic or institutional constraints, so their occurrence in certain locations/areas helps in creating a hinterlands or a chain of spatial inter-relation thereby increasing the importance of the place.

These socio-economic amenities/facilities have generally been assuming as special significance with growing emphasis on improving the quality of life at all levels, particularly in rural areas. With this perspective in view, rural development is defined as a comprehensive planning for the economic and social development of a specified geographical areas.

Thus, the main aspects of development and planning may also be studied by considering the facilities/amenities that are needed in the area and to what extent they are distributed and are available in existing set up. It is accepted that the total magnitude of facilities/ amenities indicates their availability, while its location behavior denotes the spatial patterns as an important aspect in the study.

Basically, there are two major processes of area development which are operated through the locations where the functions/facilities are available**. First process** is related to intensity and complex nature of the availability of the facilities/ functions. It is called 'Percolation process'. When the functional magnitudes are intensified more on a particular location in the area/region, it attracts the people living in the surrounding areas. Thus, attractiveness is directly related to the percolation process of development. **The Second** important process of development in the area is 'Spread effect' which is directly linked with the distance factor, that is the major element of space economy. In these processes, the distance factor is associated with the transport technology and road connectivity and its accessibility in the area. Indeed, cheap and efficient means of transport and communication networks, better road connectivity and higher degree of road accessibility accelerate fast the process of spread effects. In the North-east India, these factors of area development are seemed to be very weak especially in some parts of

the hilly region or areas of backward economy. As a result, primacy can be seen in the distribution of these activities/facilities.

This concept of spatio-functional activities/analysis is however, related to three important elements of the area. They are:

i) Location through which various production processes are being accelerated.
ii) Distance which indicates the transport network and interactional patterns of the area, and
iii) The resources of the area.

The proper analysis of these three components is essentially helpful for the balanced and self-sustained growth of the area. Therefore, the space efficiency criteria should be considered to prepare the plan of the area in which the spatio-functional facilities and its interactions plays the dominant role.

In fact, primacy in the distribution of these facilities/functions creates various problems like, local migration, functional gaps and deficiencies which indirectly affect to the spatial structure of spatio-functional facilities/activities with the distortion of its sequence of the area. The functions/facilities are in fact non-ubiquitous in nature, which means that each and every settlements of the area does not perform each and every functions or facilities. Therefore, the question arises about the choices of the functions and locations for smooth working of spatio-functional activities. This question is also related to the distance factors in spatial efficiency of the system. Incorporating these factors in space relations, the degree of spatial efficiency of locational set up of the functional facilities/ amenities is very much important to measure. To test the validity of the facts related to these aspects of functional facilities/amenities set up and their distribution in the area is the prime aim of the present study. However, various problems of development and decision making processes are directly linked with the availability of the facilities/amenities and physiographic set up of the area.

1.2 STATEMENT OF THE PROBLEM

Keeping in view of all the above discussion, it is therefore necessary to study the distributional aspects of spatio-functional facilities of Education and Health for the development of an area or a region. The aspects of the study become more relevant especially in those areas/regions where the economies are in their initial stages. In such

areas, there is an ample need of intensification and expansion of socio-economic facilities/amenities for their well-balanced development and self-sustained growth. Many studies which are related to the spatio-functional analysis conclude that, the concentration of spatio-functional facilities/amenities is the normal phenomena in its spatial patterns especially in Indian context.

1.3 REVIEW OF LITERATURE

The concerned literature can be referred here in two ways. **First**, the work which has already been done on the techniques and methods of socio-economic development is on its spatial context. **Secondly**, the case studies which have been done/are being done on the empirical aspects of spatio-functional organization. So far as techniques and methods operation system of development are concerned, there are numerous studies, which belong to Neo-classical theories of spatial organization propounded epically during 1950's. Harschman (1958) pointed out polarization processes of economic growth. This concept of development was already evolved by Perroux (1955) as 'Growth Pole' concept, Freidmann (1957) as Core-periphery interaction concept of development and Myrdal (1957) as Cumulative Causation factors and backwash and spread effects processes of development. These Neo-classical theories of development are mainly based on the tertiary activities and are related to the classical central place theory. But these approaches of development do not fit in Indian conditions where the entire set up of economy is based on primary activities. As a result, spatio-functional organization in which the development processes are operated from 'below to top' rather than top to bottom.

In Indian conditions, there are numerous studies mainly on regional or spatial planning which are citable in these connections. The pioneer works of Von Thunen (1826)[**1**], Cristaller (1933[**)2**] and Losch (1944)[3] are noticeable. The works on proper theme of regional planning of socio-economic facilities, produced by Wanmali (1970)[**4**] is one of the most significant works in India. The aforesaid works deals with the central place, hierarchy of settlements and distribution of socio-economic facilities by taking the state of Maharashtra as a case study. In the same year, Deshmukh[**5**] and Singh[**6**] studied the various aspects of planning for socio-economic development by examining the correlation between size of population and socio-economic facilities; and regionalization of transport network respectively. Another important pioneer work of Sen et.al. (1971)[**7**],

which was based on the approach of Integrated Area Development along with the work of Wanmali paved the way for researchers to carry out the works on regional planning for development. Besides, some other works were also carried out in 1972 like that of Misra et.al.(1972)[8] on urban and rural development, Das & Sarkar (1972)[9] on rural area development, Prasad (1972)[10] on Integrated area development, Wanmali (1972)[11] on clustering of services as a function of population distance in settlement systems. The works of other researchers in the same fields were published in various journals and books which brought out the attention of various researchers from different fields. Amongst the works done, the pioneer works of Sen and Misra (1974), Wanmali (1972)[12] and Sen (1975) are mainly noticeable. They followed the spatial efficiency criteria to minimize the degree of primacy in the distribution of the functions/facilities in spatio-functional organization of the areas of micro-level where micro-level economic processes of development are operative. Prof. Bhat, L.S. and his associate (1976) have done intensive studies on spatio-functional organization considering the Tehsil area of Kurnal District of Haryana. They applied statistical techniques for the measurement of functional performance and their centrality criteria for analyzing spatial structure. Misra, R.P. and Sundaram, K.V. (1980) also described on methodological aspects of micro-area planning considering spatio-functional set up at lower to higher order or from district to national planning. Maithani, B.P (1986) [13] studied on the concept and methodology of rural growth centers and its application in planning for integrated area development which was originally titled as "Central place system in the district Pithoragarh". He refers to the process of selecting appropriate locations for the provision of social facilities and production infrastructure.

During the 80's various studies were carried out on the problems of educational, health, transport and recreational facilities including the aspects of location and planning. Amani & Ansari (1982)[14] made a study on spatial organization of settlements and their importance in measuring the regional development. On the other, Betal (1984)[15] attempted to study the impact of socio- economic facilities on the distribution of population by measuring the composite score of various facilities that are available in the study area. Maithani, B.P[16] in the year of 1986, conducted a work on spatial analysis in micro level planning through social facilities and production infrastructure. Similar way, Rai (1988)[17] made a micro level study of spatial organization and rural development based on various aspects of agriculture, socio-economic facilities and existing socio-

economic services. Similar study was carried out by Rai & Singh (1990) to analyze the functional gaps among different settlements for integrated rural area development. Singh and Singh (1990)[18] made a study to identify the functional gaps in the location of socio-economic activities in different settlements. Sharma (1995)[19] et.al studied the micro-regional disparities in level of social development by taking into account the various measures of socio-economic development like education, health, transport and banking facilities. Muneer & Ahmad (1996)[20] made a study on inter-district disparities in the levels of educational development by taking the state of Uttar Pradesh as a case study. Sundaram (1997)[21] emphasized for the decentralized planning by studying the various aspects of local level planning as well as integrated rural development. Mazumder (2001)[22], assessed the quality of life in Indian cities by using the technique of multi-variate analysis and observed that the impact of social infrastructure is more than the physical infrastructure, and hence education and health play a vital role in the quality of life in particular and socio-economic development as a whole.

Some researchers from abroad have also done works on similar themes. The pioneer work of Elhance (1983)[23] on locational analysis of social facilities in India is noticeable. On the other, Routray (1984)[24] suggested the various approaches for socio-economic development of the backward districts. Similar studies have also been carried out for other countries. Shen in 1995[25] carried out a study on rural development and migration in China. Owen (1995)[26] measured the spatial and socio-economic patterns of minority ethnic groups in Great Britain.

Various studies were also carried out on the problems of education and health. Pathak (2012)[27] in his book "Development and Problems of Indian Education" mentioned the History of Indian Education system. In his book he mentioned about the constitutional provision of Indian education. He laid down some of the important provision in his book and in his concluding part he mentioned the problems of Indian Education. He also emphasised on universalization of elementary education in India. Sen (1991)[28] gave his opinion that education can ensure freedom of mankind. It is capable of providing the essential freedom that is required for an individual to achieve freedom from not only poverty but also from oppression and exploitation. Sreenivasulu (2013)[29] gave his opinion that Education is today's need as it is not only the development of intellectual skills and knowledge but also to effective growth and development of Indian Economy. The Education system needs to make students as learner's innovators,

scholars, researchers and trainers. Akhtar & Deka (2016) [30] mentioned the importance of higher education in improving the condition of a community. They conducted the study to understand the participation of Karbi Community in higher education in the district. They concluded that higher participation toward higher education is seen in urban areas than the rural areas. Gangale (2019)[31] in her journal pointed out about the tribal education in India. She also mentioned about the problems and issues of tribal education in India. Moreover, she recommended the measure to improve the educational status of the tribal population in India. Tokbipi (2017)[32] in her journal mentioned the existing problems of education in Karbi Anglong district. She also suggests the conditions to improve the education scenario in the district. In the journal she urged the district administration and parents to play a crucial role to bring sudden leap in educational level in the district.

Curtis and Jones (1998) while outlining the studies undertaken in geography with respect to health have stated that studies on variation of health in space and comparative studies of health populations in a particular place over time are a recurring theme in health geography. They have further suggested that spatial variation in health may be analyzed based on the composition of the population and on the context "which depends partly on the social and physical environment in the area" (Curtis, S., & Rees Jones, I. 1998) [33]. In this regard, they have identified three types of theoretical framework. The first type is related to "spatial patterning and diffusion of physical and biological risk factors". The second type is related to "the role of space and place in social relations" and the third type is related to "the senses of place ... to understand the significance of place for health inequities" (Curtis, S., & Rees Jones, I. 1998)[34]. Studies pertaining to India such as those by Balarajan, Selvaraj, and Subramanian (2011) and Reddy, Patel, Jha, Paul, Shiva Kumar, and Dandona (2011) have particularly referred to the poor quality of health care for the rural population and for the poor people in the urban areas. Balarajan et al. have specifically mentioned the suboptimal utilization of preventive health care in India with variation in the use of these services "by gender, socioeconomic status, and geography" (Balaranja n, Y., Selvaraj, S., & Subramanian, S.V. (2011) [35]. The study also revealed the existence of caste-based inequalities in immunization with low coverage among the scheduled tribes and the scheduled castes as compared to the other castes and higher immunization coverage in the urban areas compared to the rural areas. Further, Balarajan et al. (2011) also reported variation in resource allocation between

states and between urban and rural areas. It revealed that rural areas face many challenges with respect to preventive and curative health services, such as, physical access including "better transport, roads, and communication networks" to reach the "disadvantaged and physically isolated groups" and the lack of adequate human resources (Balaranjan, Y., Selvaraj, S., & Subramanian, S.V.2011) [36].

These results from the above mentioned studies on education and health access inequities across the region, therefore, bear significance for the present study which is confined to the hilly and tribal areas of Karbi Anglong District of Assam.

1.4 OBJECTIVES

By taking into account the above points of spatio-functional setup of Karbi Anglong District, Assam, proper attention was focused on the following objectives:

i) to study the natural and human resource structures,
ii) to examine and describe the existing spatio-functional facilities/activities,
iii) to describe the volume and intensity of functional interaction at various locations,
iv) to analyze spatio-functional analysis of education and health facilities,
v) to suggest new strategy of decentralized spatio-functional facilities/activities for proper utilization of local resources.

It is obvious that, above objectives are mainly related to the resource structure and locational setup of the socio-economic facilities of the area. In fact, resource structure and spatio- functional organization of any area are inter-related and interdependent mutually (Hermansen, 1971).

1.5 RESEARCH QUESTIONS

The following research questions were proposed to be investigated in the course of the present study.

i) What are the distributional patterns of spatio-functional facilities and how they are related to the resource structure of the area?
ii) How the Nodal centers are emerging in the area in relation to its socio economic background?
iii) What ought to be locational patterns of nodal centers?

1.6 METHODS AND DATA BASE

To give the answer of the first question, the distributional patterns of spatio-functional facilities/activities and the resource structures of the area have been described. Due to hilly and undulating topography and unfavorable agro-ecological conditions of the area, agriculture and its allied activities are found to be less dominant. On the other hand, if we consider man as a resource, the population requires some social and economic facilities for the balanced development of the area. The human resources are described by taking into account the occupational structure and demographic feature of the area. The simple cartographic techniques have been applied for inferring the results related to the resource distribution. Also the distributional maps of the physiographic conditions and demographic structure of the area are prepared to understand the areal variation. The distribution of education and health facilities, their availability and intensity have been shown separately with the help of maps and diagrams and interpreted and analyzed block-wise. And then, the related pictures of the resource distribution of these facilities and functions have been highlighted to find out the causes of the areal variation.

The second question is directly related to the aggregation of these facilities and functions especially to identify the nodal centers and to study the functional hierarchy. Although various statistical techniques have been adopted for the measurement of functional performance and centrality criteria of the nodes where these facilities exists, Mishra and Sundaram (1980) also described methodological aspects for spatio-functional setup for micro-area planning giving the arbitrary weightages to each and every facilities/functions for aggregating their strength. Moreover, Bhat and others (1976) have applied statistical techniques for the measurement of the centrality of the main centers of Karnal area of Haryana. They gave the weightages to the facilities/functions according to their areal strength and emphasized that lesser the number of centers having facilities/functions in the area have greater importance and vice versa. This criterion is helpful for analyzing the areal locational patterns of socio-economic conditions of the area. The same criteria have been applied in the present study for calculating the centrality scores of the nodal centers.

In the present study, the functional nature of these nodal centres is analyzed by distinguishing them into four orders for 2011, whereas, for the 2016 the same could not

be done due to non availability of village wise population data. The emerging patterns of those centres are studied by finding out the differences of the centrality scores. The nature of distribution of these centres is interpreted by preparing the scatter diagrams. Furthermore, the general distribution of various functional facilities has been shown by graphs and diagrams.

Although the sources of many of the information for this thesis are of secondary in nature, there exists a wide variety as each aspect in such a spatial frame of study as this requires a separate base. The geographical personality of the area is described with the help of distribution maps for which base map is taken from District Census Hand Book, Karbi Anglong District, Series-19, Part-XII-A, Census of India, 2011, Assam. On social and economic aspects, the Census of India, particularly, District Gazetteers, District Economic Statistical Hand Book, etc., have been the analytical base. Most of the information have however been collected by the researcher by visiting various related offices which have become the primary source of latest information. Besides these Secondary sources mentioned above, 24 numbers of Revenue villages, 34 numbers of Health centres (CHs, PHCs, PHSCs, SDHs, SDs, and Sub Centres) and a total of 22 numbers of Education institutions covering almost all the 11 C.D Blocks have been surveyed by researcher by visiting the respective villages, health centres and educational institutions using simple Questionnaires (Appendix-III) which have become the main primary source for the present study. Apart from these, GPS has also been used to determine the exact location of the health centres. The latest maps showing the location of education institutions have been drawn basing on Survey of India map which has become the main source of information. However, because of lack of latest population records and statistical accounts regarding the facility/functions and their locations, for the present study, 2011 census has been considered as analytical base especially for the population figure. For the analysis of other facilities/functions like, socio-economic and functional hierarchy as well as their centrality criteria, various related information has been collected from concerned department considering up to the 31st December 2016. However, in some of the cases the data has been collected considering up to the year 2019 due to the non availability of data for 2016.

1.7 CHAPTERIZATION

The present study has been arranged systematically into Six Chapters. The **First Chapter** deals with the general introduction. It presents Conceptual Background, Statement of the Problem, Review of Literatures, Objectives, Relevant Research Questions, Data base and methodology adopted for the analysis and Chapterization of the study.

The **Second Chapter** incorporates the Geographical framework of the Study area. It deals with the brief account of Geographical Location, Administrative Set-up, Physical and Cultural setting of the study area.

The **Third Chapter** deals with the Natural and Human resources and their distributional patterns. It represents a systematic description and interpretation of both the resources.

The **Fourth Chapter** includes the Locational patterns of functional facilities and the historical accounts of the development of Educational facilities and Health facilities in Karbi Anglong District are analyzed. In this chapter, beginning of formal education in the study area and progress of education after Independence is also analyzed incorporating the present education systems in the district. The spatial analysis of Health infrastructure keeping in view the present availability of health care facilities in the district is also analyzed.

In **Chapter Fifth**, Spatio-functional pattern of the facilities has been dealt with. In this chapter Threshold population, Identification of centres, Weightages, Centrality Scores and Functional Hierarchy are analyzed in detail. While the findings and Conclusions of the present study has been discussed in **Chapter Sixth**.

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CHAPTER - II

GEOGRAPHICAL FRAMEWORK OF KARBI ANGLONG DISTRICT

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2.1 HISTORICAL BACKGROUND

Before Independence, the Karbi Anglong district had no separate identity. During the British period, the Karbi populated areas of the Nagaon district was constituted as the Mikir Hills tract of Nagaon District[1]. Then after 1913-14 the Mikir Hills sub division was formed and according to Assam Regulation of 1951,[2] the Joint Mikir Hills and North Cachar Hills District was constituted. Till then, the areas of the present Karbi Anglong District were apportioned between Sibsagar, Nagaon and United Khasi Jaintia Hills and North Cachar Hill districts. Later the Karbi inhabitation areas of these three districts were united into one unit and the large body of Karbi People came under one administration. The district was created then (under the Tribal Areas Department, Government of Assam) only on 23rd June, 1952 as an Autonomous District with the name "United Mikir and North Cachar Hills" with two sub divisions. The North Cachar Hills portion was later disintegrated from Mikir Hills.

The name of the present district Karbi Anglong appears to have originated from the then Mikir Hills Sub-division which was constituted into Mikir Hills District on February 2, 1970 and was renamed as Karbi Anglong in 1976 Vide Govt. Notification No. TAD/R/115/74/47/ dt 14/10/1976[3]

The name 'Karbi Anglong' is believed to have been derived from the word 'Karbi' drawn from the term 'Thakar kibi', a sacred festival performed by the people to worship god during marriage and harvesting. Thus, "Kar" from Thakar and "Bi" from kibi together formed Karbi. The word Anglong means high and standing hills. Thus, the name of district is known as "Karbi Anglong"[4]

2.2 GEOGRAPHICAL LOCATION

The hill zone of the state of Assam is composed of two hill districts namely – Karbi Anglong and North Cachar Hills District (now Dima Hasao). The zone is characterized by undulating topography where Karbi Anglong is mostly dominated by low hills with gentle slopes. The region is home to many aboriginal tribal people

belonging mostly Karbi, Dimasa, Rengma, Garo, Lalung and Bodo tribes. The region although is rich in natural resources but not much develop due to poor condition of means of communication and transportation in economic as well as industrial activity. Agriculture is the mainstay of the rural people of the region, specifically Jhum cultivation still remains the predominant economic activity of the tribal people.

For the present study, **Karbi Anglong**, a tiny hill district located in the central part of Assam in North-East India has been selected. The people of Assam saw the birth of a new district named as the United Mikir and North Cachar Hills District emerged on the 17th November, 1951. The new district was formally created on the aforesaid date vide Govt. Notification No. TAD/R.31/50/201 dated the 3rd November, 1951[5] with some parts of the districts of Sibsagar (now Golaghat-4382 sq.km), Nagaon (4421sq.km), and United Khasi Hills and Jaintia Hills (1543 sq.km) district of present Meghalaya for all round development of the tribal folk of the central Assam. The portion taken from Nagaon and Sibsagar Districts were partially excluded areas of the two districts and were called Mikir Hills Tract. On the other hand, the portion taken from United Khasi and Jaintia Hills Districts were also known as excluded areas, mainly inhabited by the Karbi. This was followed by bifurcation of the erstwhile district of United Mikir and North Cachar Hills District into two separate districts under the banner as Mikir Hills and North Cachar Hills District in 1970. The Karbi Anglong, the other day known as Mikir Hills District was again rechristened as Karbi Anglong District on 14th October, 1976 vide Govt. Notification No. TAD/R/115/74/47 Dated 14/10/1976[6]. Thus, Karbi Anglong (Karbi means people and Anglong means Hills) came into being as a full-fledged separate district in the map of Assam with its Head Quarters at Diphu the first hill town of the entire state of Assam after the formation of Meghalaya State. Presently, the district enjoys autonomy under the provision of Sixth schedule of the Indian Constitution. It is the largest district of Assam in terms of its total geographical area.

The District Karbi Anglong, the mesmerizing hill district blended with dense tropical forest covered hills, its rich bounty of flora and fauna and flat plains, is situated in the central part of Assam between $25^{o}33'$N to $26^{o}35'$N Latitudes and $92^{o}10'$ E to $93^{o}50'$ E Longitudes **(Fig 1.1)**. It is distinguished by the inter-district boundary-Nagaon and Golaghat district on the north, Nowgaon district and Meghalaya state on the west and by the inter-state boundary-Nagaland on the east and finally by the North Cachar

Hills and the Jaintia Hills of Meghalaya on the south. The district is mostly rugged and hilly being part of an Archean plateau. The plateau in Karbi Anglong comprises of two parts- the East and the West Karbi Anglong.

LOCATION MAP

KARBI ANGLONG DISTRICT, ASSAM

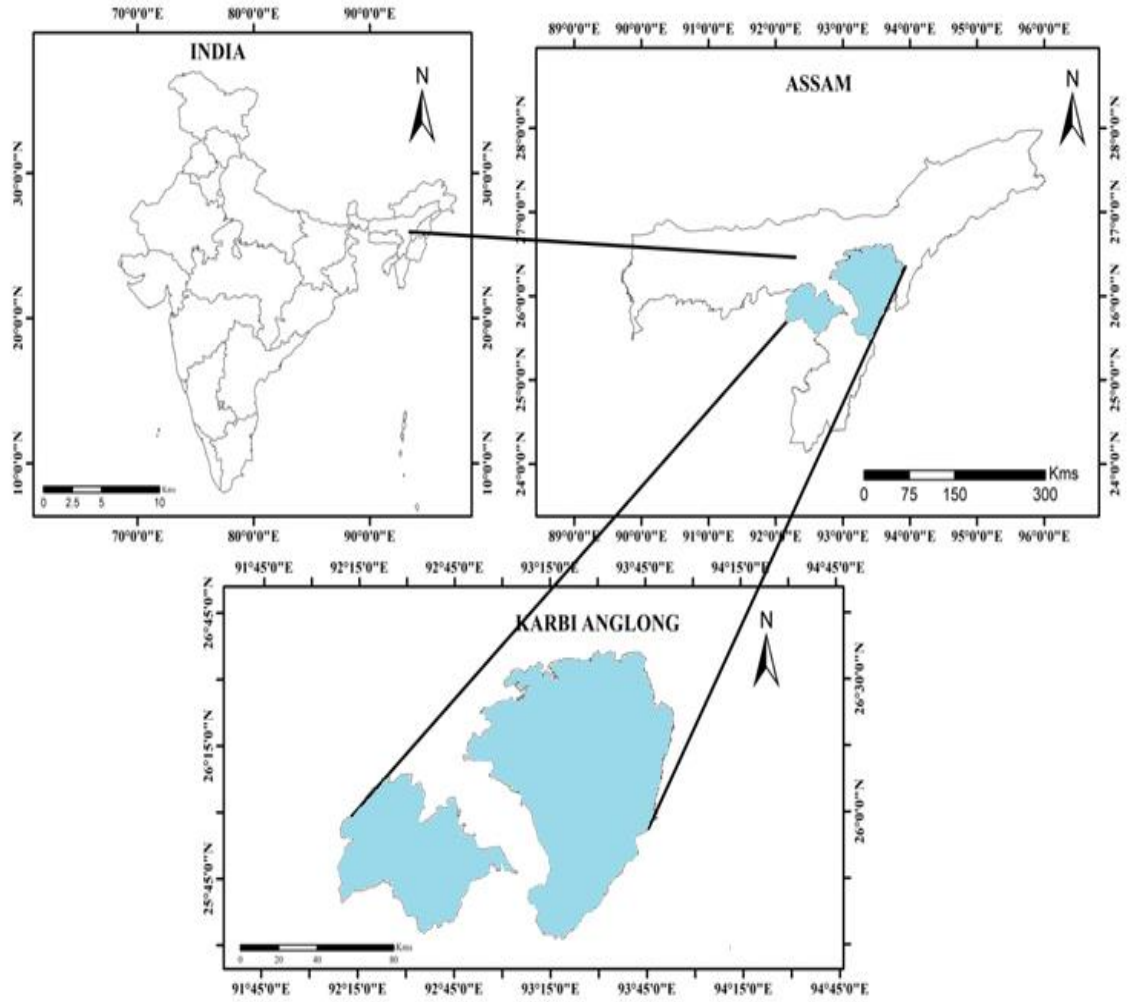

Fig 1.1

Source: Survey of India, 2013

ADMINISTRATIVE MAP OF KARBI ANGLONG DISTRICT, ASSAM

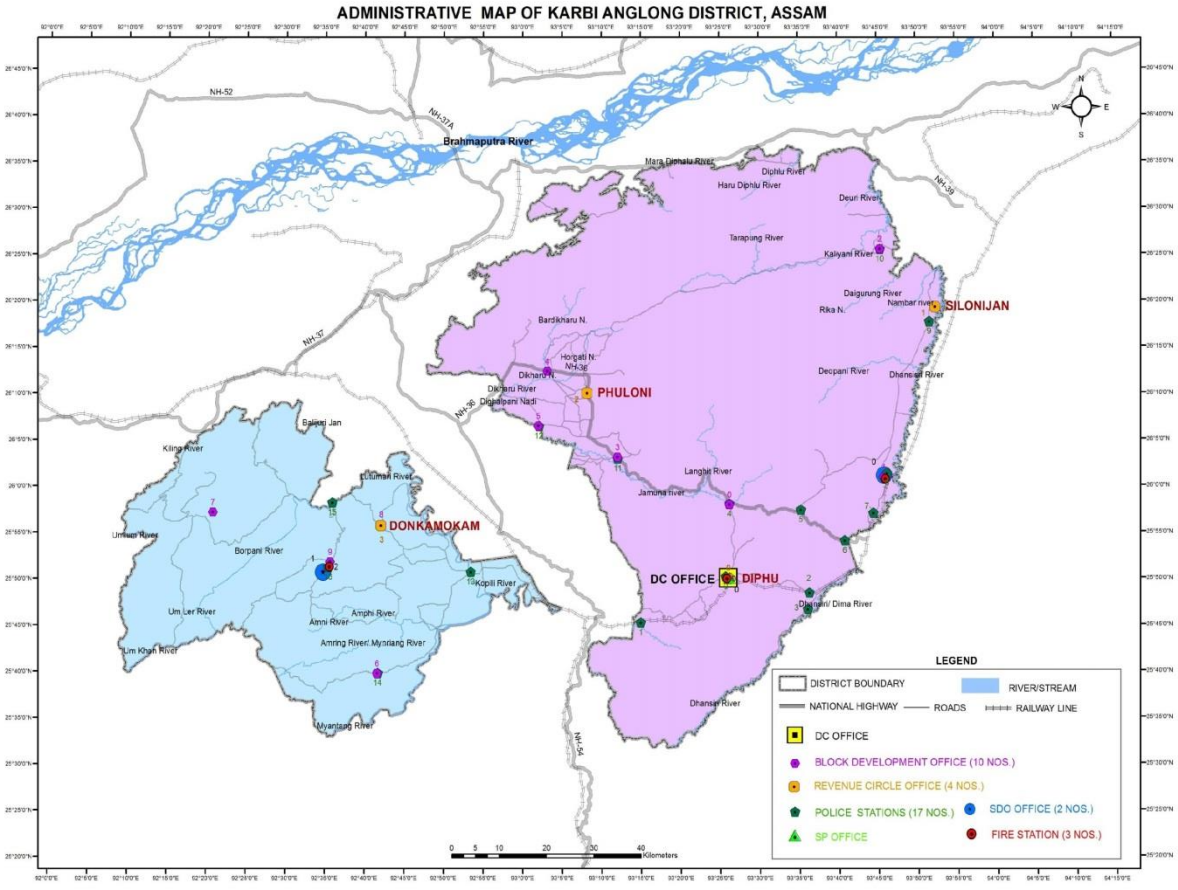

Fig 1.2

Source: Survey of India

2.3 ADMINISTRATIVE SET UP

The District Karbi Anglong is politically one of the Autonomous Hills Districts in the state of Assam, India constituted under the provision of 6th Scheduled of the Indian Constitution. It came into existence on 23rd June, 1952 under the provision laid down under para-2 of the 6th Scheduled of the Indian Constitution namely "Karbi Anglong Autonomous Council" (KAAC). The pattern of administration in the hill district is comparatively different from the plains districts of Assam. Almost all the development departments of the district are under the control of the Karbi Anglong Autonomous Council and are looking after by the authority of the council for all round development of the district.

The Karbi Anglong Autonomous Council consists of a total of 30 (thirty) members of which 26 (twenty six) are to be elected and 4 (four) are to be nominated. The tenure of the Council is for Five Years. The powers and functions of the Council may be broadly divided into 4 (four) categories, namely Legislative, Executive, Financial and Judicial.

The entire district is divided into three sub divisions, namely, Bokajan and Hamren with its headquarters at Bokajan and Hamren respectively and the Diphu Sadar Sub division with its headquarters at Diphu. The Diphu and Bokajan Sub-divisions are geographically separated from the Hamren Sub-division by Nagaon District which lies in between the Sub-divisions. There are altogether 11 Community Development Blocks (CDBs), 4 Revenue Circles and 2712 inhabited villages and 209 uninhabited villages (2011) in the district. The name of CD Blocks with its Headquarters and Sub-divisions and the Block wise population and area of the district is given in **Table 1.1 & Table 1.2** respectively.

Table 1.1

Name of Community Development Blocks (CD Blocks) with its Headquarters and Sub-Divisions

Sl. Nos.	Name of CD Blocks	Head Quarters	Sub-divisions
1	Amri	Ulukunchi	Hamren Civil Sub-division
2	Bokajan	Bokajan	Bokajan Civil Sub-division
3	Chinthong	Hamren	Hamren Civil Sub-division
4	Howraghat	Howraghat	Diphu Sadar
5	Lumbajong	Manja	Diphu Sadar
6	Nilip	Chowkihola	Bokajan Civil Sub-division
7	Rongkhang	Donka	Hamren Civil Sub-division
8	Rongmongve	Kat Teron	Bokajan Civil Sub-division
9	Samelangso	Dokmoka	Diphu Sub-division
10	Socheng	Zirikindeng	Hamren Civil Sub-division
11	Langsomepi	Bakulia	Diphu Sub-division

Source: www.karbianglong.govt.in

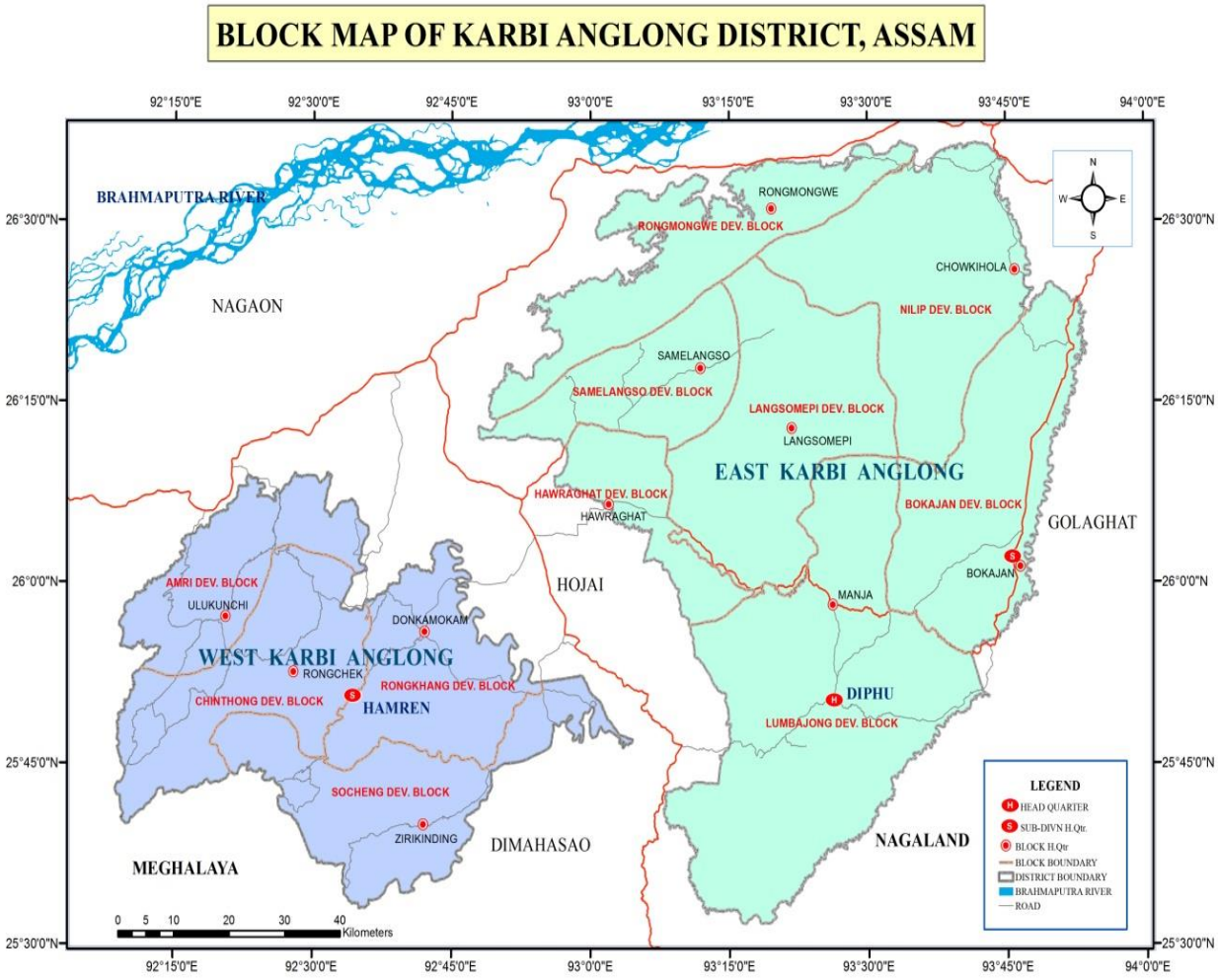

Fig 1.3

Source: Survey of India

MAP OF COMMUNITY DEVELOPMENT BLOCKS
KARBI ANGLONG DISTRICT

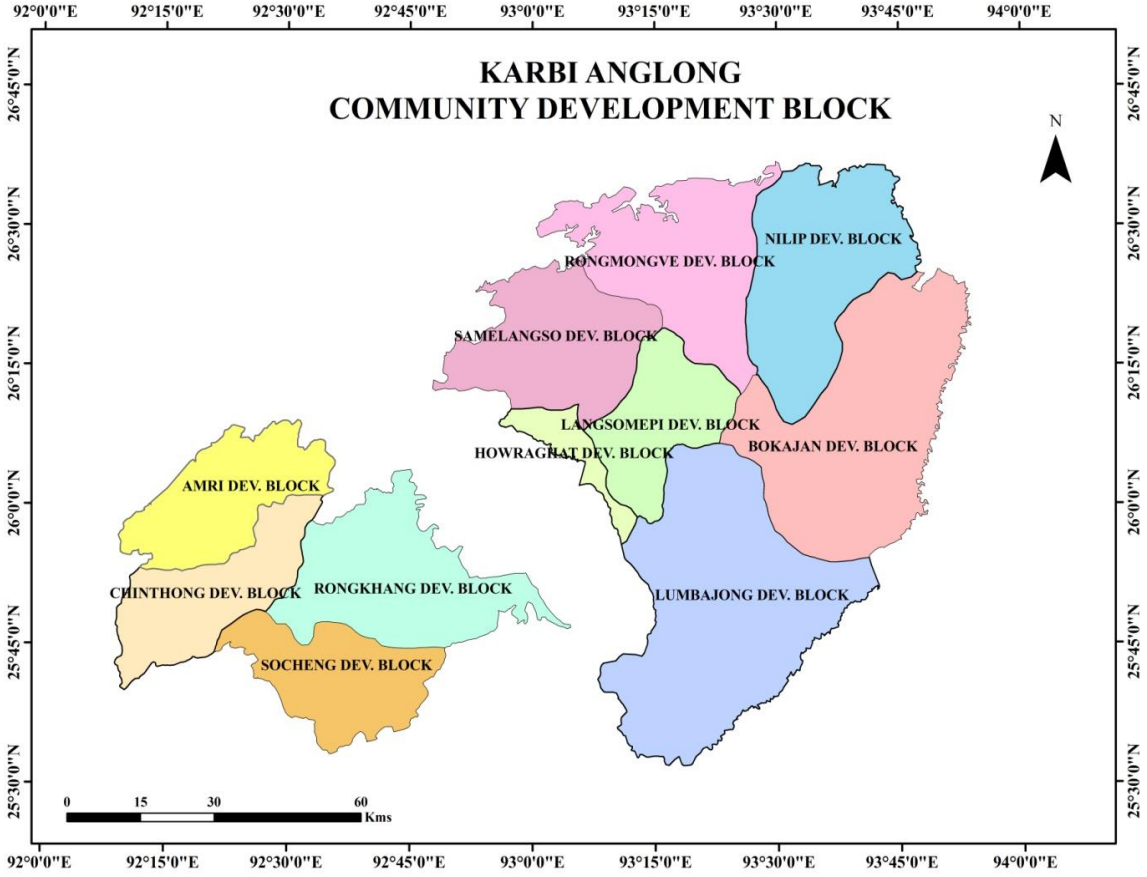

Fig 1.3(a)

Source: Survey of India

Table 1.2

Block-wise Population and Area of Karbi Anglong District, 2011

Sl. No.	Name of C.D Blocks	Population	% of Population	Area in Sq. km.	% of Area
1	Amri	45,573	4.77	167.57	1.61
2	Bokajan	1,44,917	15.15	165.33	1.59
3	Chinthong	46,553	4.87	179.04	1.72
4	Howraghat	1,27,673	13.35	160.91	1.54
5	Lumbajong	93,914	9.82	237.22	2.27
6	Nilip	50,057	5.23	248.24	2.38
7	Rongkhang	1,58,035	16.53	333.36	3.20
8	Rongmongve	32,773	3.43	128.64	1.23
9	Samelangso	63,869	6.68	181.47	1.74
10	Socheng	27,334	2.86	112.91	1.08
11	Langsomepi	55,157	5.77	96.28	0.92
	CD Block Total	**8,45,855**	**88.46**	**2010.97**	**19.27**
	District Total	**9,56,313**	**100.00**	**10,434.00**	**100.00**

Source: District Census Handbook, Karbi Anglong District, Series-19, Part-XII-A, Census of India, 2011, Assam

N.B: The area figures of the CD Blocks are the total of the village areas coming under each C.D Block. The area figures for the district are the same as adopted by the Surveyor General of India to maintain uniformity at the national level.

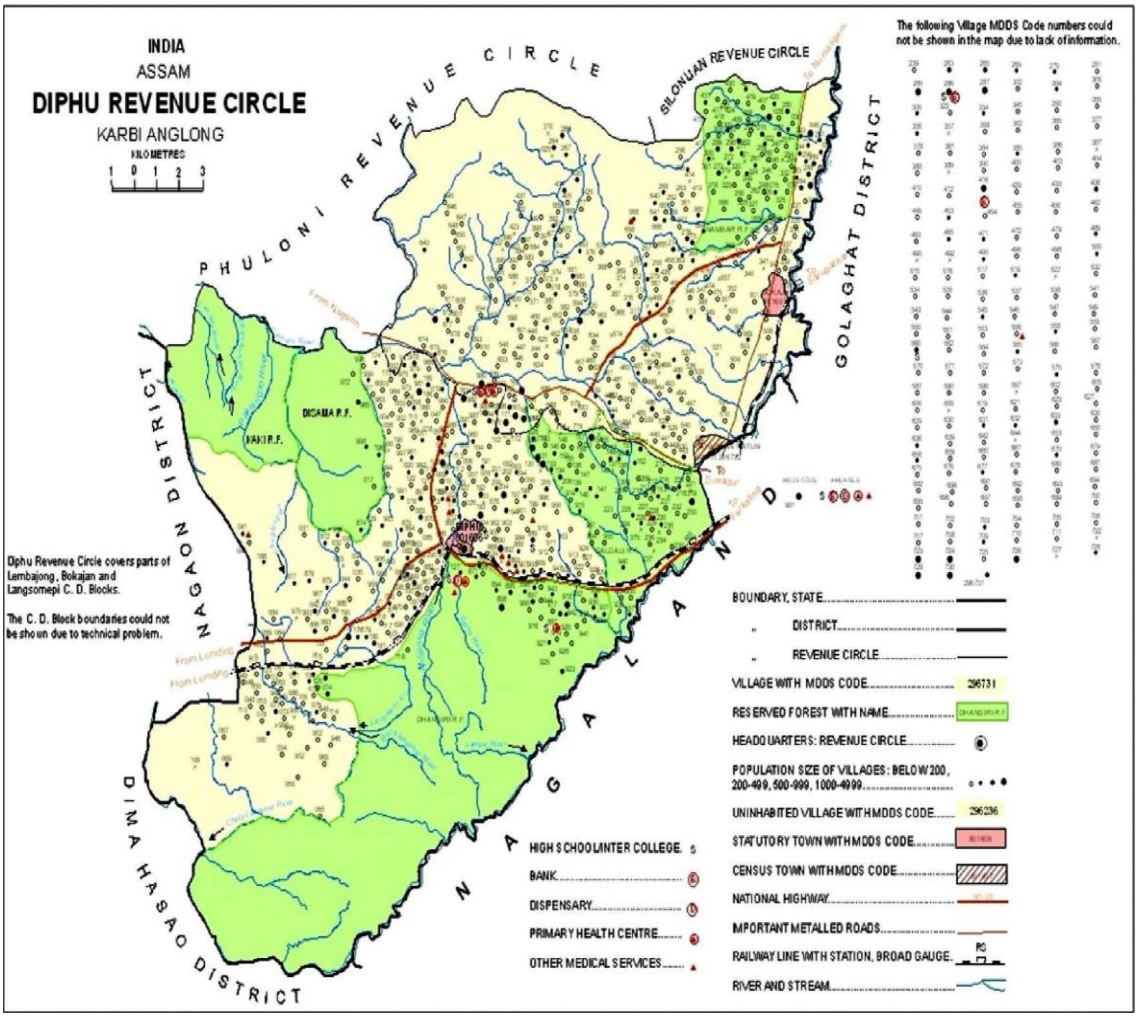

Fig 1.4

Source: District Census Handbook, Karbi Anglong District, Series-19, Part-XII-A, Census of India, 2011, Assam

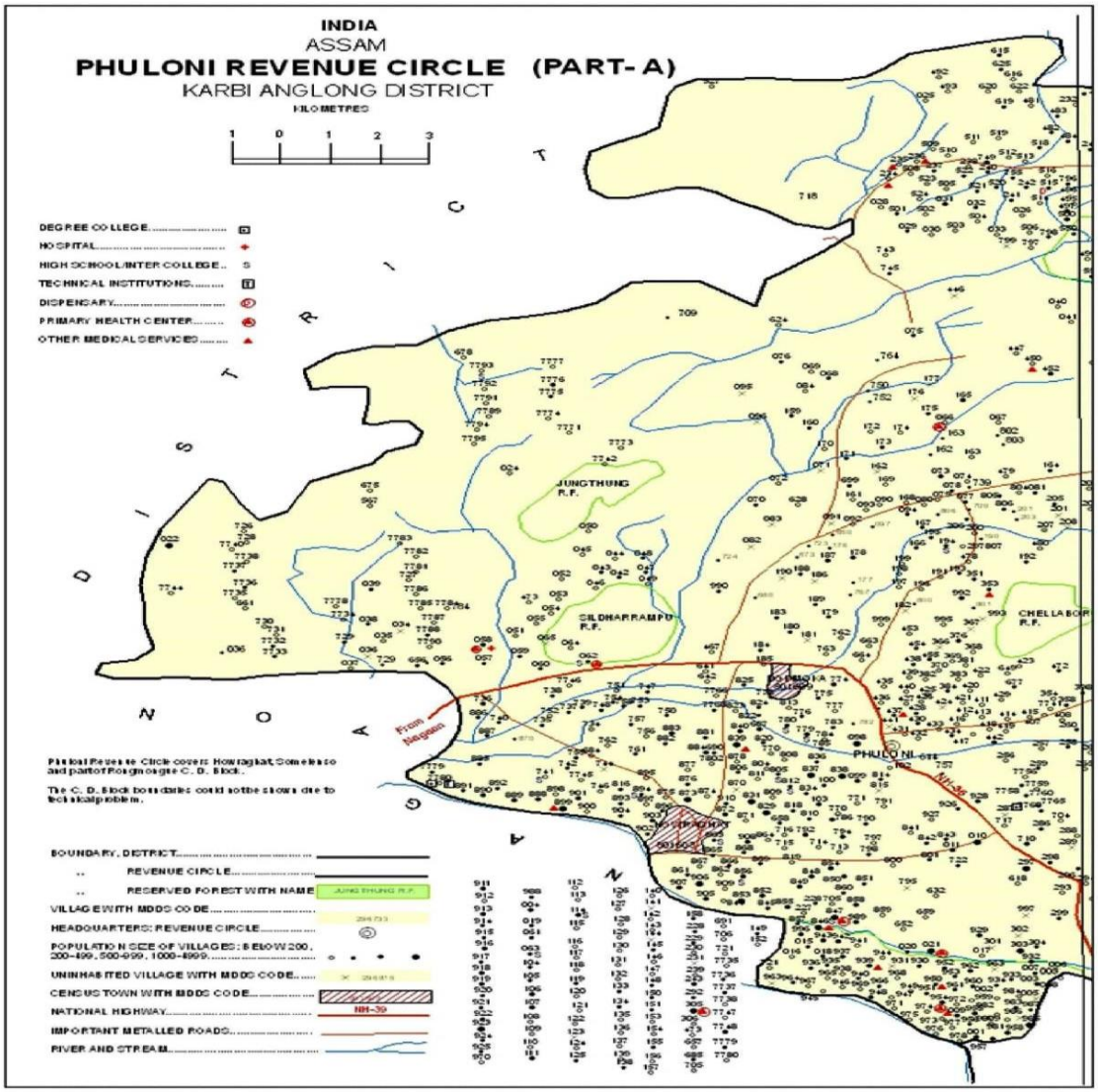

Fig 1.5 (a)

Source: District Census Handbook, Karbi Anglong District, Series-19, Part-XII-A, Census of India, 2011, Assam

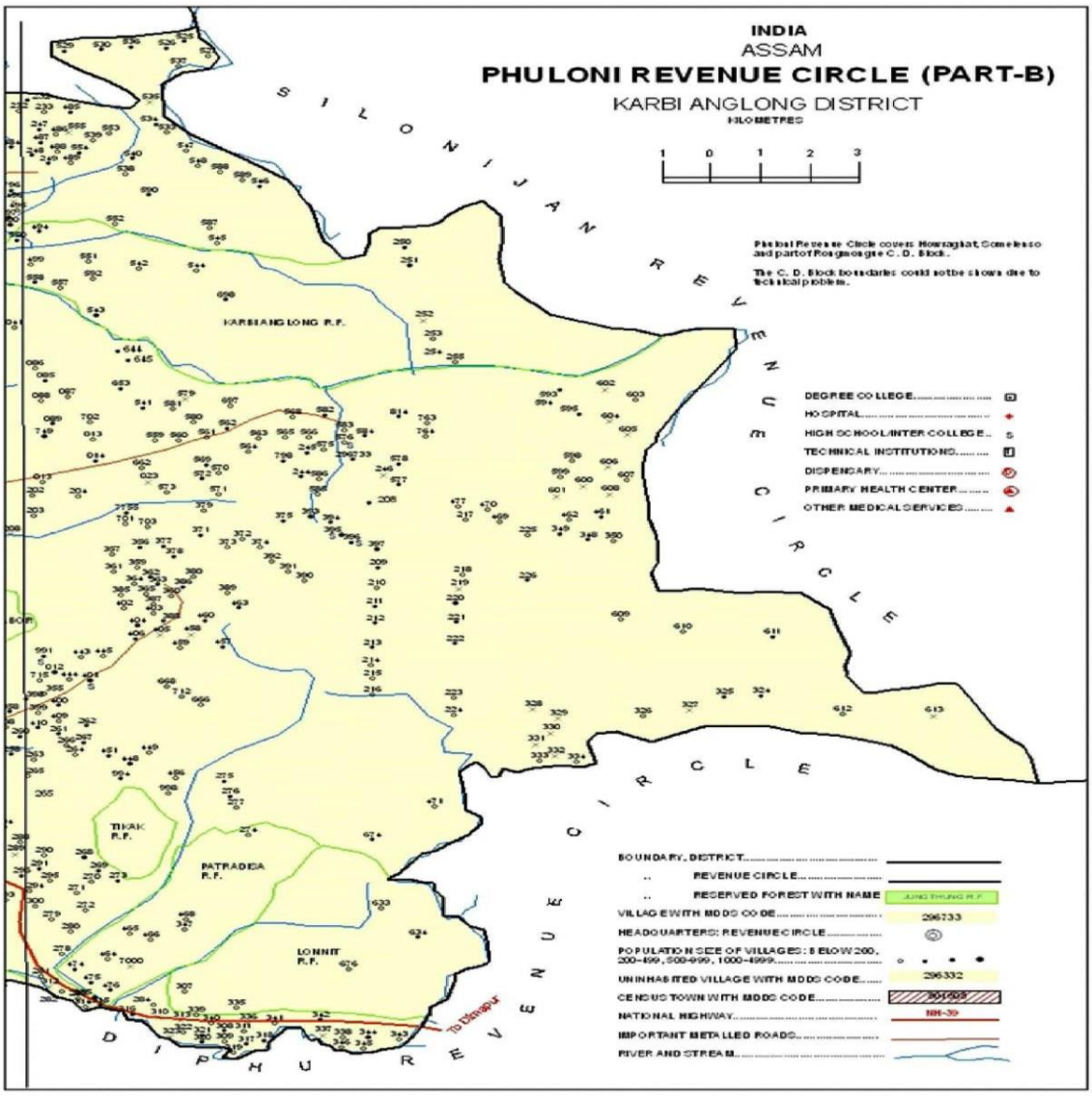

Fig 1.5 (b)

Source: District Census Handbook, Karbi Anglong District, Series-19, Part-XII-A, Census of India, 2011, Assam

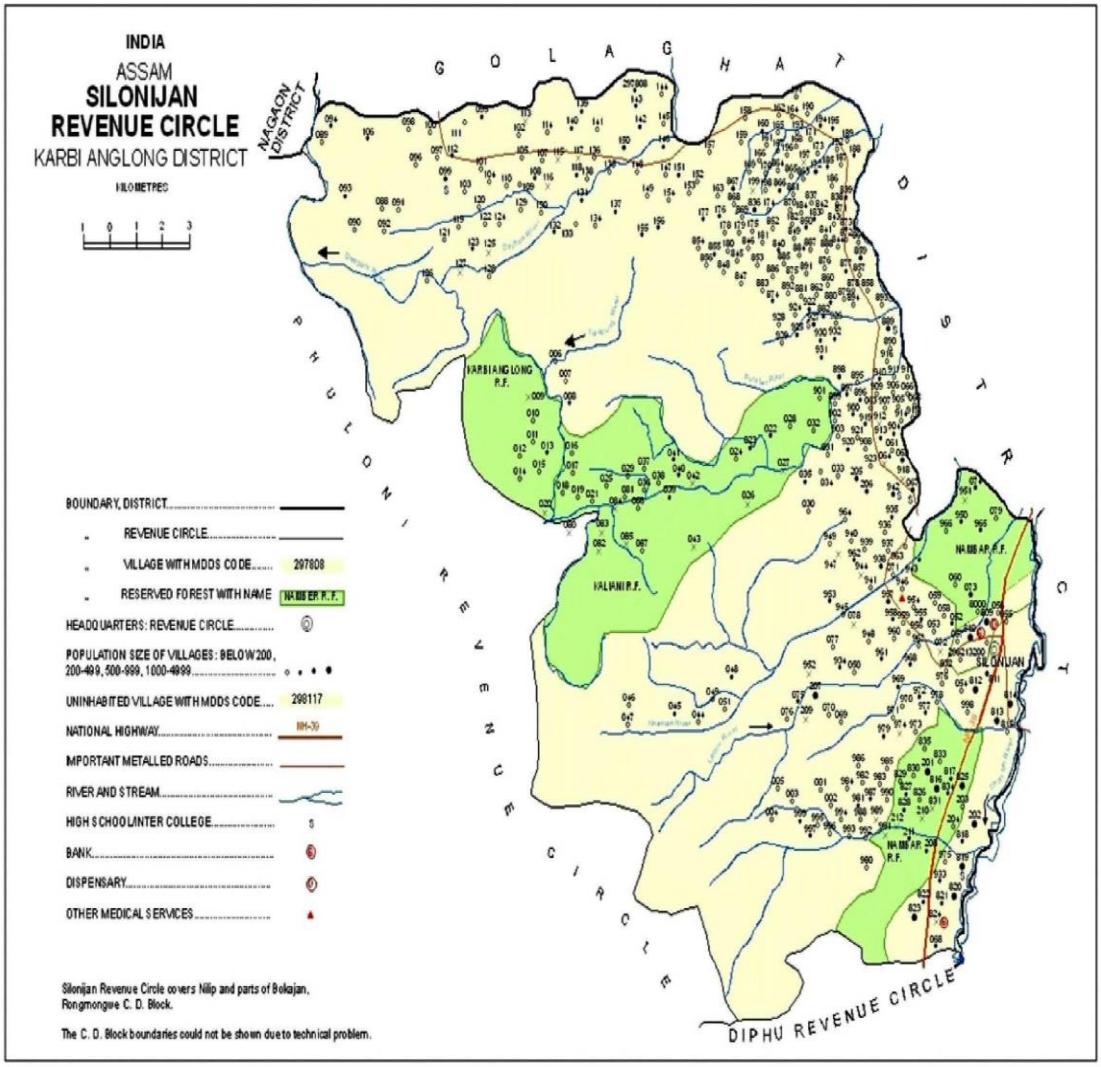

Fig 1.6

Source: District Census Handbook, Karbi Anglong District, Series-19, Part-XII-A, Census of India, 2011, Assam

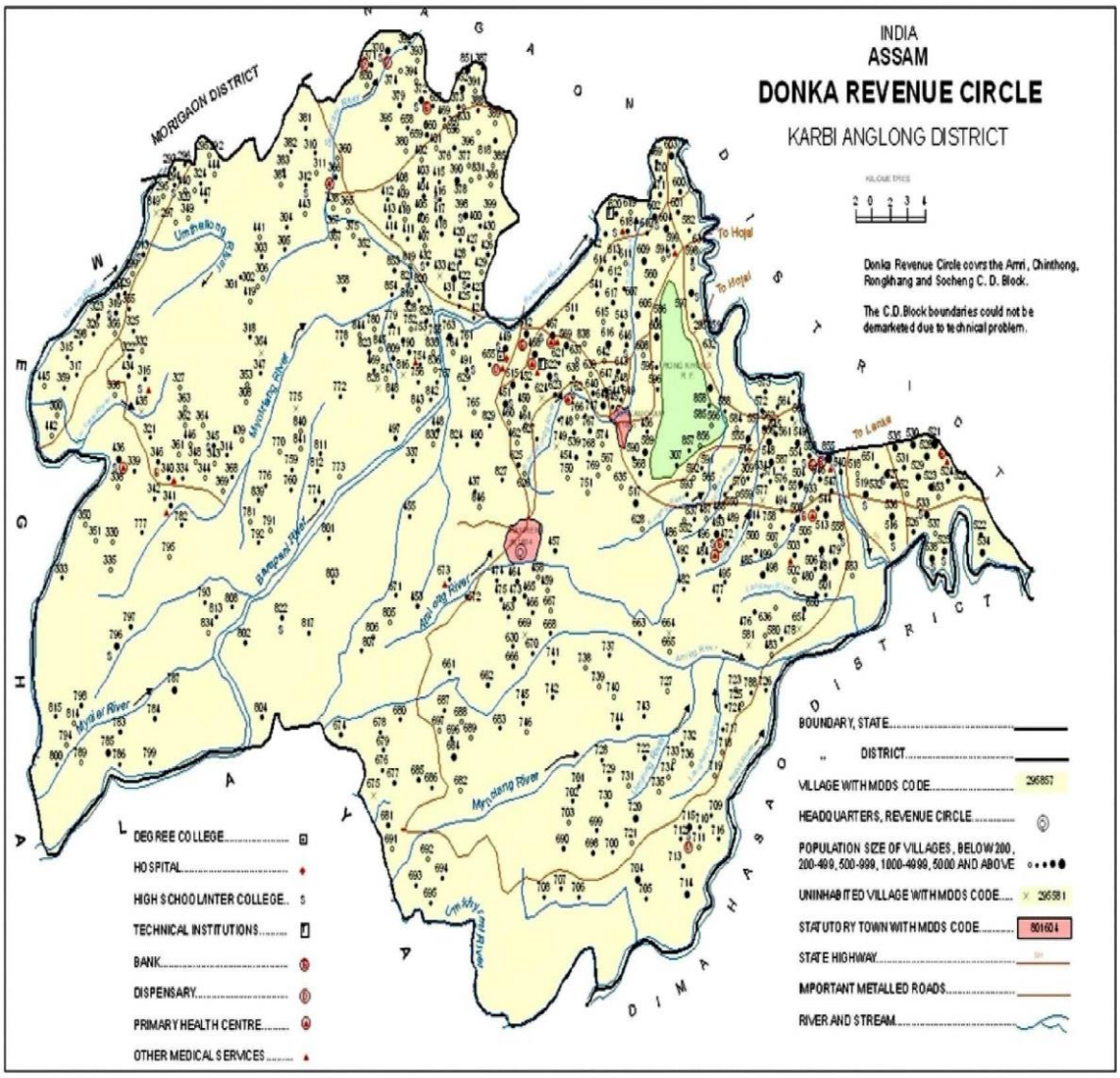

Fig 1.7

Source: District Census Handbook, Karbi Anglong District, Series-19, Part-XII-A, Census of India, 2011, Assam

2.4 GEOLOGY

The geological setting of Karbi plateau is a complex one. The plateau represents north-eastern most extension of the stable South Indian Plateau. Geologically the Karbi Anglong district is closely related with Meghalaya Plateau and hence is mostly undulating, rugged and hilly being part of an Archean origin and the Purvanchal Hills which is of Tertiary origin. Having passed through different geological periods, the area had gone tremendous tertiary disturbances especially the south eastern part of the region, causing superimposition of tertiary rocks over the Pre-Cambrian basement and

lot of Metamorphism, folding and faulting had taken place. Thus, on the basis of stratigraphy, the rocks of the plateau region can broadly be classified into different age groups, namely, Quaternary, Tertiary, Pre-Cambrian and Archean age group **(Table 1.3).**

The rocks of the Quaternary epoch particularly include the unclassified older and new alluvial deposits. The older alluvium is composed of clay, coarse, sand, shingle gravel and rounded boulders while, the newer alluvium is composed of clay, silt, sand, pebbles, cobbles and lie on lower grounds on the valley floors. Both old and new alluviums are found along the borders of Karbi Anglong falling in the valleys of Dhansiri, Kopili, Jamuna, Dikharu, Langpi and the banks of the streams, tributaries and rivers both in the hills and foothills.

The Tertiary groups of rocks, starting with the Jaintia series are found extensively in the southern and south-eastern parts of Diphu Sub division, while isolated patches of it occur in the Nambor areas of Dhansiri valley. The Tipam series of sandstone, clay, shale and conglomerate occur in the entire southern part of Diphu sub division. Jaintia series of sandstone and lime stone occupy the Kopili valley of Hamren sub division.

The dominant rock types in the district are of Precambrian age. The Pre-Cambrian group includes the Shillong group of Sedimentary rocks. They cover a small area over the western part of the Karbi hills across the Kopili valley. These rocks mostly consist of Quartzite and phyllite. Granite also occurs in the western part of Hamren sub-division.

The Archean rocks are the oldest rock formations and form the basement over which younger rocks were deposited. These groups of rocks, which include mostly granite metamorphic rocks such as quartzo-feldspathic gneiss and biotite schist, amphibolites, quartzite, occur in the entire Hamren sub-division. In the hills of Karbi Anglong, the rock types show a variation from coarse grained porphyritic to foliated biotite granite associated with intrusive pegmatite, quartz veins and basic silla and dykes. (Phangcho, P.C. 2003)[7]

Table 1.3

Stratigraphical Column of Karbi Plateau

Groups	Rock Types	Area of Occurrence
Quaternary	Rounded boulder, shingle gravel, coarse sand etc.	Valley region
Tertiary	Sandstone, limestone, shale, carbonaceous shale	Southern and south-eastern parts of Diphu plateau
Pre-Cambrian	Shillong group	Western flank of the Karbi or Mikir Hills across the Kopili valley
Archean	Basement Gneissic complex	Entire Hamren sub-division and northern half of Diphu region

Source: phangcho, p.c,

2.5 PHYSIOGRAPHY

The relief and drainage systems of the region exhibit a high degree of relationship with its geology. The relief of the region is mostly rugged and hilly being part of an Archean plateau. The plateau in the region comprises of two parts, vize, the East and the West Karbi Anglong. The Karbi Plateau represents the north eastern most extension of the stable Gondwana massif, and thus a part of the Karbi Anglong District i.e., Hamren sub-division is physiographically, a part of the Jaintia Hills of the Meghalaya plateau, while, the other part, where Diphu is located i.e. Diphu sub-division forms a separate physiographic unit, having been isolated by the head streams of the Kopili and its plains which is an oval in shape and highly dissected and the Dhansiri in the south from the Meghalaya plateau. The plateau has been further denuded by rivers like Jamuna, Nambor, and Kaliani and dissected deeply here and there.

The general topography of the study area is such that, the areas having hard resistant rocks of granite and gneiss, etc. have been standing high and forming plateau over extensive areas, whereas less resistant tertiary rocks have been formed high mountain or range.

2.5.1 RELIEF

The Karbi Anglong plateau is an extension of Deccan plateau and thus a part of the Meghalaya plateau having an elevation of 300m to 400m with moderate slope. While

a part of the Karbi inhabited area i.e., Hamren sub division is physiographically a part of the Meghalaya plateau, the other part, i.e., Diphu Sub division forms a separate physiographic unit. The relief pattern of the region widely varies from denuded plains to hills. Thus to know the relief of the region, it has been explained in detail in the following manner:

The general relief of the eastern part of the study area is comparatively less rugged than the western part, except for the central part of East Karbi Anglong the rest of the region has a general slope towards north and north-east i.e., towards the Nagaon plain (**Fig 1.8**). Over Archaean and Jurassic rocks the heights attains the level of more than 1,067m. The extreme southern margin, where the Barail range is standing like a wall overlooking the Cachar plain on the south again, rises more than 1,220m. The northern borders merge into horizontal plain of alluvial deposits of the rivers like Kopili, Jamuna and Dhansiri and their tributaries. All the marginal plains remain below 152.44m (500ft) contour. Eastern Karbi Anglong slopes down in all directions with somewhat higher degree towards south. Towards north it forms several extensive ridges with flattish surfaces separated by river valleys. The western Karbi Anglong areas more or less uniformly run down towards north-east maintaining a moderate slope. At many places rivers and its tributaries have cut it into narrow and steep sided valleys. As s result, the southern flank is highly dissected. The bordering plains of Karbi Anglong, at many places, are mere marshy lands uninundated by monsoon floods. The plains of the region eventually merge with that of the mighty River Brahmaputra. The plain area of Karbi Anglong covers mainly Howraghat, Bokalia, Balipathar and Bokajan area. The topography of the eastern part of the region is comparatively less rugged than the western part of the region. However, the topography having uneven character and narrow valleys between low hill ridges ranging from 100m to 180m above mean sea level with occasional solitary flat-topped low hills are found.

The Karbi Anglong primarily an agrarian district is blessed with numerous rivers and tributaries. The most important among them are Kopili, Amreng, Borpani (Karbi Langpi), Kaliani, Jamuna, Dhansiri, Dikharu, Nambor, Deopani, Longnit, Patradisa, Doirang and Diphu rivers. Broadly, there are two drainage systems in the district, namely,

(1) Kopili drainage system, and

(2) Dhansiri drainage system.

The Kopili with its vast catchment and basin areas and large annual discharge of water is one of the largest tributary systems of the Brahmaputra River. The main drainage of Kopili originates from the eastern border of the Jaintia Hills and flows northeastward through Doiyangmukh for about 60 to 70 km forming the boundary between West Karbi Anglong and North Cachar Hills, and West Karbi Anglong and Nagaon districts. The Umkhen and the Umiam are the most important tributaries originating in the high plateau of Khasi Hills. These rivers flow from south- west to north-east almost parallel and in accordance with the general slope of the relief and finally meet the Kopili that joining the kolong near Chaparmukh in Nagaon district and then the Brahmaputra River near Guwahati. The Umiam River is known as Karbi Langpi or Borpani within Karbi Anglong.

Both the Kopili and the Langpi pass through gentle slopes except in limited number of places where they have formed narrow and deep valleys and rapids, cascades and low waterfalls. Other two important tributaries, namely, Jamuna and Dikharu originate from the south and south western flanks of the east Karbi Anglong from the altitude of about 1219.2m (4,000 ft). Both the tributaries meet the Kopili near Jamunamukh in Nagaon district.

Dhansiri is the most important river bordering Karbi Anglong in the east. The main course of river Dhansiri originates from the Thingtubun Peak of Barail Mountain 1868.30m (6128ft) and flows northward forming the boundary between Assam-Nagaland up to Dimapur and flows through the boundary between Karbi Anglong and Golaghat district and finally joins the Brahmaputra River at Dhansirimukh. River Kaliani is the only big tributary of Dhansiri within the region. It originates at a height of about 1066.8m (3500ft) and runs eastward to meet Dhansiri River. Other tiny but important tributaries found in the region which flows from the west are Nambor nadi, Daigurung, Deopani, Laijan, Sarihajan and Bokajan, etc.

There are no significant river system along the northern flank of East Karbi Anglong and the southern flank of the Barail range. Only few tiny streams like Deopani, Kaipani, Diphu, etc, originating at a height of about 609.6m (2000ft) flow down to the Golaghat and Nagaon plains and meet the river Brahmaputra on the north. Besides, a tiny river the Diphu River is the only river flowing from south to the north through the main town Diphu, the Head Quarters of the District Karbi Anglong.

Table 1.4

Rivers and Drainage in Karbi Anglong

Name of Rivers	Length in Kilometer (single course falling within the region)
Kopili	102.50
Umkhen(Langpi)	77.50
Umiam	47.50
Jamuna	75.00
Dikharu	57.50
Dhansiri	150.00
Kaliani	80.00
Daigurung	40.00

Source: phangcho, p.c. p.13

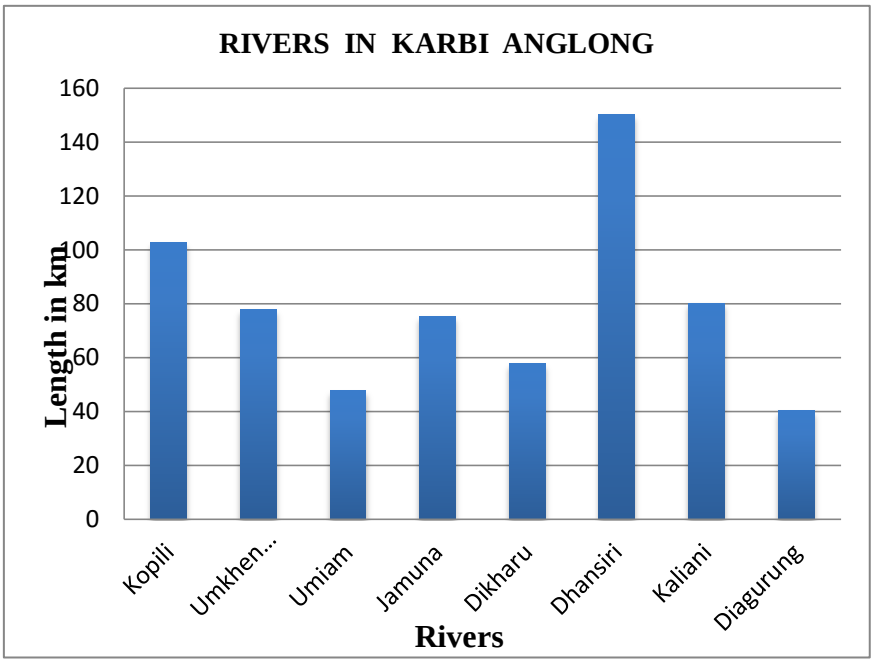

Fig 1.1

Source: Survey of India

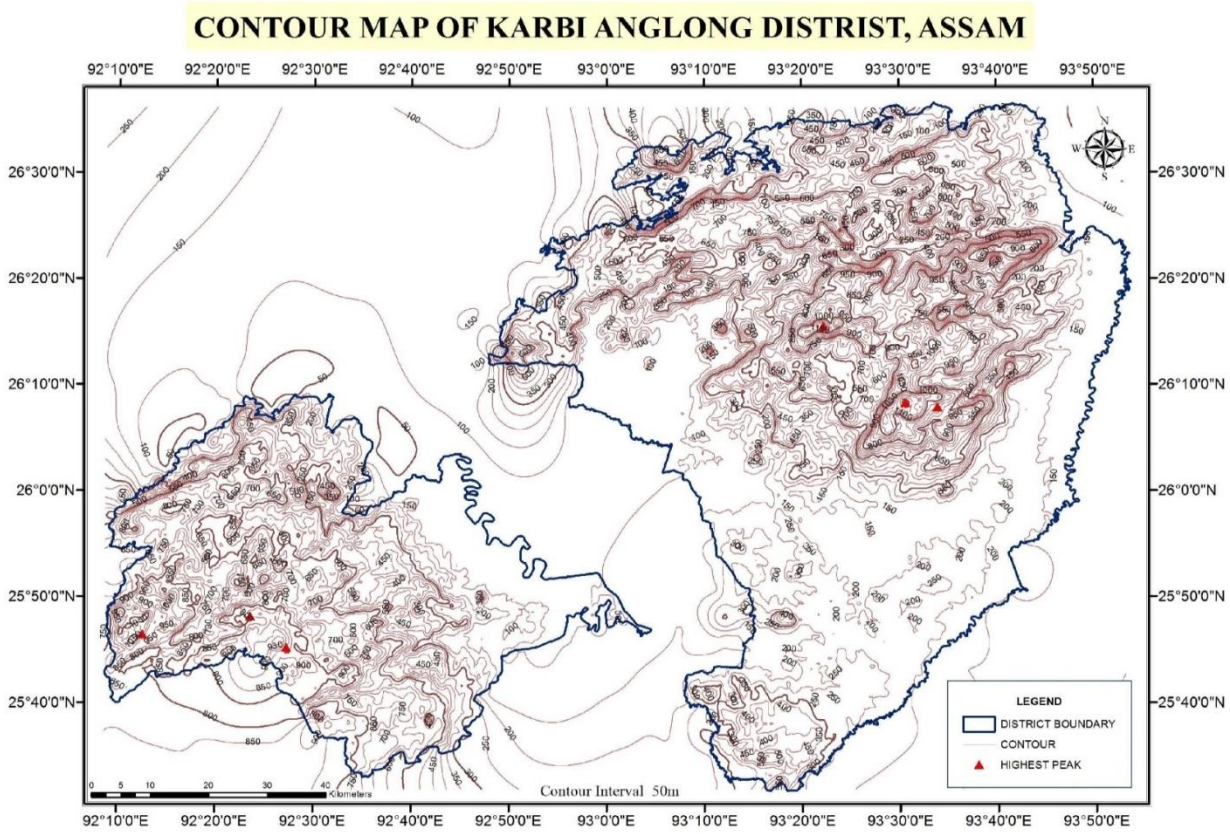

Fig 1.8

Source: Survey of India

2.5.2 LAKES AND TANKS

A few numbers of naturally occurred lakes and tanks are also found in Karbi Anglong District. There are altogether 6 lakes/ponds, 37 ox-bow lake, 10 tank in the district. Most of these lakes are in fact the marshy areas and are natural fisheries locally known as 'Beels' or 'Pukhuries'. These are located mostly in the areas like Hawaipur, Lankajan, and Beedengpi etc. A good number of such marshy areas have been created in the plains part of Karbi Anglong due to the presence of meanders and abandoned courses of Kopili and Dhansiri Rivers.

2.5.3 SPRINGS

Numerous Hot springs often famous and act as attraction to picnic lovers and tourists also occur in the upper reaches of the Kaliani river of Eastern Karbi Anglong. The waters of the hot springs are said and believe to have some medicinal effects

especially for skin diseases. The underground water of Eastern Karbi Anglong has however recently (1999) proved to be unhygienic and unfit rather unhealthy for direct consumption as the fluoride content in the underground water is very high. (The permissible content is up to 1.5 mg/liter, while in some parts the tube wells and deep ring wells give water having fluoride content ranging from 1.58 mg/liter to 15.40 mg/liter which after being consumed for long time cause a kind of disease called Fluorosis.

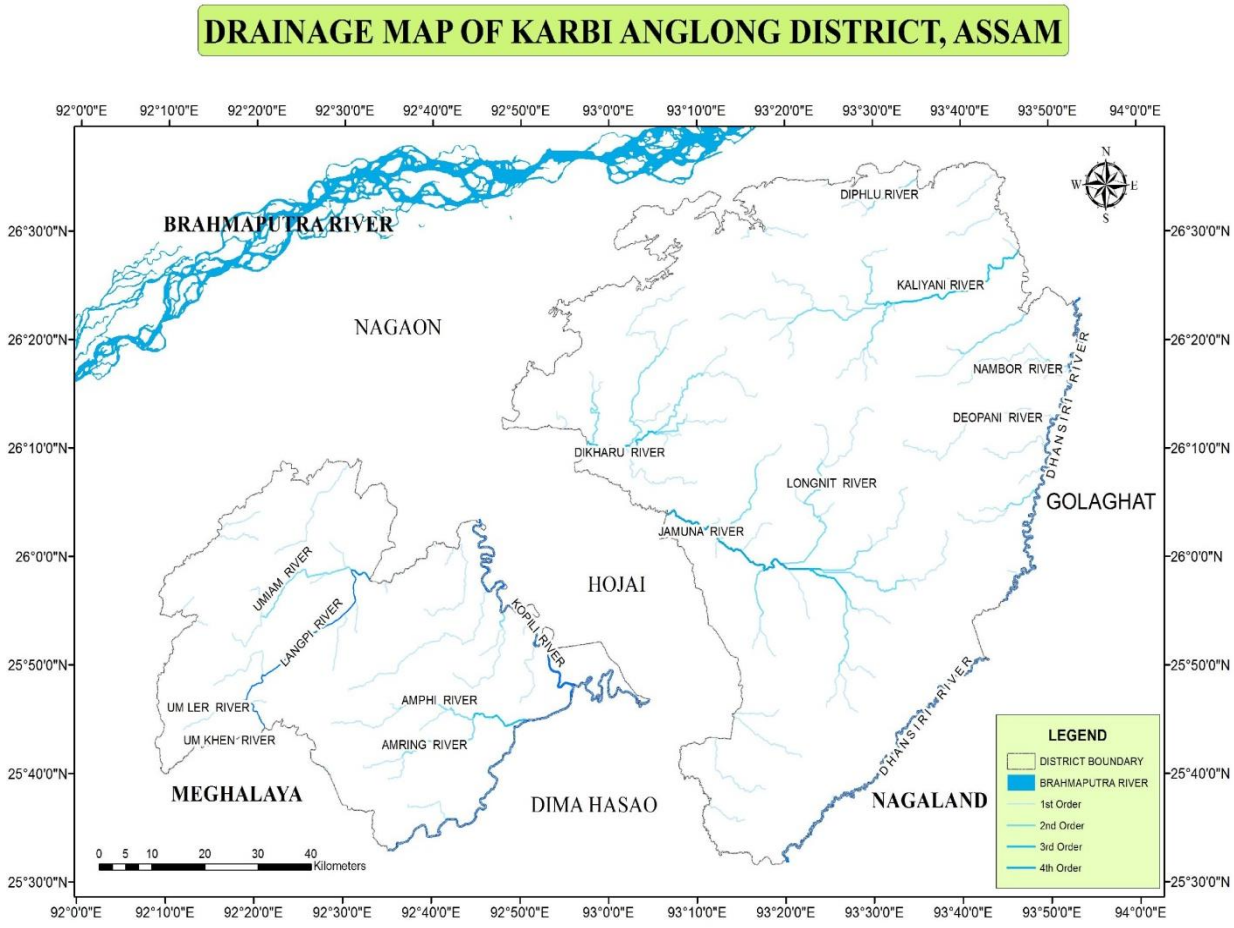

Fig 1.9

Source: Survey of India

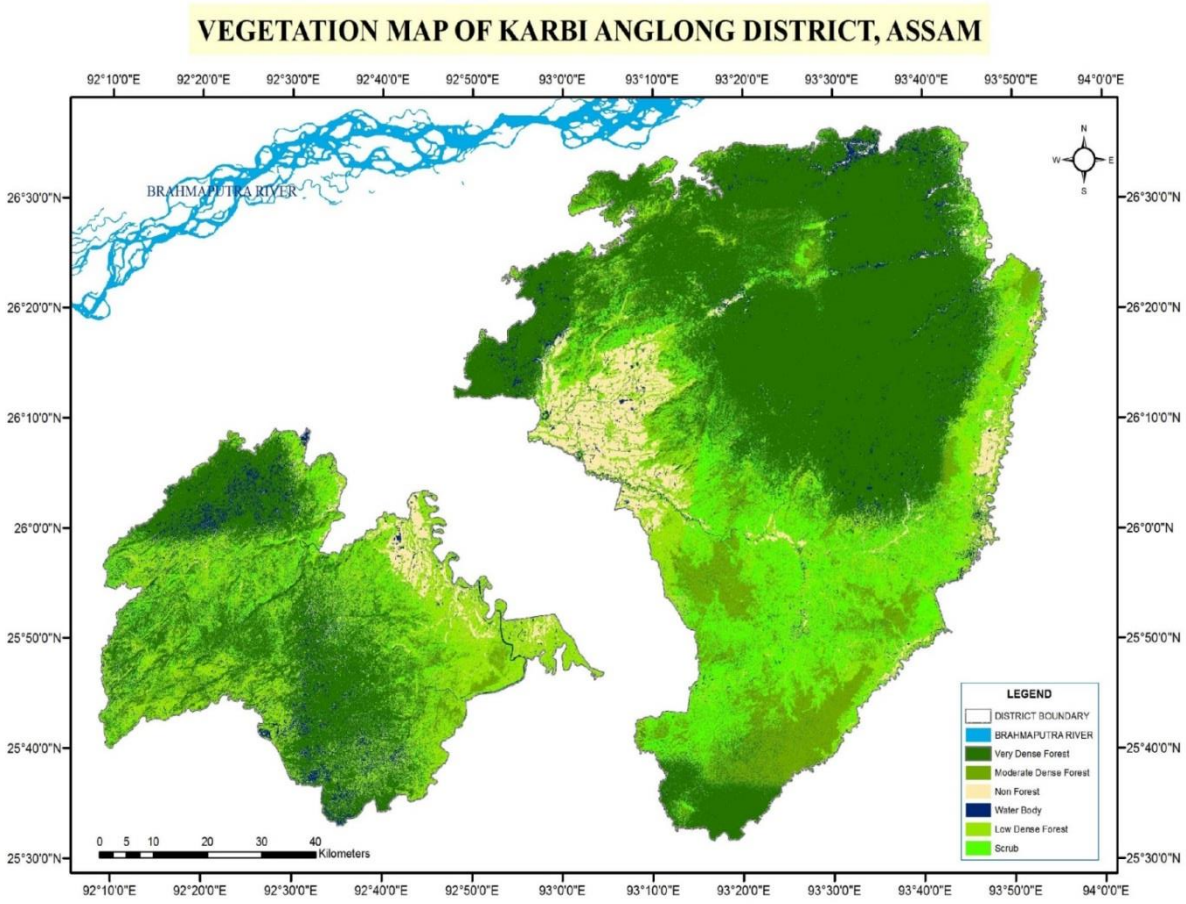

Fig 1.10

Source: Survey of India

2.6 PHYSICAL DIVISIONS

On the basis of relief and drainage, the region of Karbi Anglong can be divided into Five Physiographic divisions as shown in the Table below (**Table 1.5**).

Table 1.5

Physical Divisions of Karbi Anglong District

Name of Physical divisions	Area in Km^2	Geological characteristics	Major relief and drainage features
1. Chenghe-Arnam plateau	3,884	Granite, gneiss, quartz and quartzite including patches of Sylhet Trap and few Tertiary formations.	Two important peaks namely Chenghehishon and Arnam Rongmam where from most of the drainage originate forming radial pattern.
2. Hamren Plateau	2,395	Similar to the Chenghe-Arnam Plateau but with the absence of Sylhet Trap.	Practically no peak, most areas are flattish with smooth crests. Parallel drainage, greatly controlled by underlying rocks.
3. Rongkhang Plain	1,010	Parts of the vast plain of the Brahmaputra. Layers of new alluvium of great thickness	Horizontal plain with number of marshy lands, meanders, lakes at places interspersed by isolated hillocks.
4. Howraghat Plain	1,100		
5. Bokajan Plain	1,040		

Source: phangcho, p.c. pp 15-16

The Chenghe-Arnam plateau (3884 sq.km), commonly known as Mikir Hills, is the largest physiographic division comprising about 26% of the total area of the region. The plateau is higher on the central and the northern side, rising above 4000 ft. as in the case of Chenghehishon peak itself which is 1,359.45m (4,459ft.). Other high peaks are Dambukso 1,173m (3,848 ft.), and Khunbaman 1,132.60m (3,715ft). North and western portions are dominated by extensive ridge-like features which form sharp spurs separated by wide stream valleys along the margin. Northern margin is somewhat steep but the edges have been cut by streams resulting in penetration of narrow-plains. Most streams originate from two points, namely the Chenghehishon peak and the Arnam rongmam peak from where the plateau takes its name.

The Hamren plateau is in fact an extension of the Shillong plateau. The western most peaks of the plateau are named as Umlapher. The plateau forms a physiographic

division distinct from the Chenghe-Arnam plateau in the sense that it has slope only one side i.e. towards the Rongkhang and the Nagaon plains into which it merges smoothly. Rivers like Umiam, Barapani and the tributaries of Kapili have created deep gorges and steep waterfalls where the Cheleng Athepai is one such deep gorges located near Amtreng in the plateau region.

The Rongkhang and the Howraghat are the two major plains of the region and both the plains are in fact the extension of Nagaon plain and are formed as a result of erosion and alluvial deposits of Kopili and Jamuna rivers and their tributaries respectively. The Rongkhang plain is about 55 km long from Baithalangso to Doiyangmukh and about 15 km in breath. This narrow strip of plain has been formed by the river Kopili and its tributaries. On the other, the Howrahgat plain is formed by the river Dikharu, and Yamuna and its tributaries and is the largest plains in the district. The breath of the plain varies from 15 km to 30 km and is as narrow as 10 km at some places.

The other plain, i.e Bokajan plain have been formed by the Dhansiri River and its tributaries like Kaliani, Doigurung, Nambar, Deopani and Laijan. The plain is about 70-75 km long but its breath is not more than 10 km. The Bokajan plain is a part of the Golaghat plain and the Naga Hills merges into it in the southern fringe. This plain is covered with marshy lands and moors. These three plains together comprise about 21% of the regional area. Most of the human settlements and their activities are concentrated in these three plains making them developed and progressive.

2.7 CLIMATIC CONDITIONS

The study area (hill zone) being located on the eastern side of the Meghalaya plateau experiences and enjoys different climates in different parts due to variations in the topography. The climatic condition and the daily weather of the hilly districts are mainly controlled by three dominating factors, viz, (a) position on the leeward side of the Meghalaya plateau, (b) variable altitude, and (c) the vegetation cover. Although the effect of the first factor is commonly felt almost throughout the district, the other two factors being variable, causes local differences in climatic condition. The pressure of the relatively high Meghalaya plateau has to a great extent influenced the climate of the Karbi Anglong District. Moreover, the Cherra-Dawki escarpment of Meghalaya the Barail range and the western border hills of Manipur obstruct to some extent the easy access of south-west monsoon winds blowing from the south into heart of the region

(Phangcho P.C,1978). This condition gives rise to a rain shadow effect to the extreme most eastern part of Hamren Subdivision and the bordering areas of the Hojai division around Lanka and Lumding.

The general climatic phenomena of the region are such that, the rainfall is not uniform throughout the district. It is due to the rain shadow effect that, the average annual rainfall decreases gradually towards the central portion from above 1,300 mm to below 1,100 mm.

The region, experiences monsoon with intermittent torrential showers from April and continues up to August. The climatic condition in summer high humidity coupled with temperature makes the weather very sultry, hot, enervative and exhaustive. The average annual mean maximum summer temperature ranges from 23^{o}c to 32^{o}c, while in winter, it ranges from 6^{o}c to 12^{o}c. The period from June to August is the wettest season in the district. The climate of the Hamren Sub division, the western part of Karbi Anglong District differs greatly from that of the Diphu Sub division of East Karbi Anglong District.

The climate of the district is moderate in winter which begins from October and continues till February. Winter is dry and comfortable except for a few occasional showers due to the retreating monsoon which brings down the temperature almost abruptly and the monthly average rainfall remains below 25mm. January is the coldest month at higher altitude and hence frost is not uncommon in Chenghehishon and Khunbaman peaks. Winter fogs and mists are common in occurrences over the hills. The easterly winds bring the fogs from the Brahmaputra plains and spread them over the entire northern foothills. These fogs at times continue to envelope for long hours in the morning. Usually these blanket the interior high lands of the district.

During true monsoon, most areas, excepting high altitudes, experience damp and oppressive weathers leading to malarial conditions. At places lying at low altitudes, temperature records as high as 36^{o}c that creates rather an unbearable. The average annual rainfall ranges between 1155.6mm and 1424mm with the rainiest months in June, July and August. More than 80% rural population depends on agriculture and rainfall is the only source of irrigation for their cultivation. The rainfall is however not uniform throughout the district. The eastern slopes receive comparatively higher rainfall than the western slopes. The differences are mainly due to the rain shadow effect of Meghalaya

plateau. In the district, CD Blocks like Lumbajong, Samelangso, and Nilip receives rainfall between 1000-2500mm. But the area between Kheroni to Dhansiri is a main rain shadow area and therefore receives even less than 1000 mm rainfall. In the areas like Mailoo, Hawaipur, Doyangmukh and the entire Howraghat plain experience semi dry condition during the months of April and May and continue up to June in some years.

Scarcity of drinking water in most of the areas is a great problem for which people in general especially in the remote upland areas mostly depends on the dwindling supply of the natural sources, such as river, streams and streamlets etc. The climatic disadvantages therefore find themselves reflected in the physical appearance of the people.

2.8 AREA AND POPULATION

The Karbi Anglong District, being the largest district ranks as the 1st largest district in Assam and 56th largest in India (www.indiamapia.com)[8] covers a total geographical area of 10,434 sq. km out of which 10,397 sq.km is rural and only 37 sq.km is urban which accounts for about 13.53 % of the state's total geographical area of 78,438 sq. km. with a total population of 8, 13,311 comprising of 4, 22,250 male and 3, 91,061 female population (2001) out of which 7, 21,381(88.70 %) resided in the rural areas and 91,930 (11.30%) in urban areas. But the total population increased to 9,56,313 (2011) comprising of 4,90,167 males and 4, 66,146 females population of which 8,43,347 (88.18%) resides in rural areas and 1,12,966 (11.82%) in urban areas. In rural areas 4, 31,924 and 4, 11,423 are males and females respectively. Accordingly, 58,243 and 54,723 are males and females respectively reside in the urban areas of the district. The district share 3.05% to the total population of Assam which comprises 44,961(4.70%) Scheduled Castes population of which 23,436 (4.78%) are males and 21,525 (4.62%) are females. The total Scheduled Tribes population in the district is 5, 38,738 (56.33%) of which represents 2, 72,460 (55.59%) males and 2, 66,278 (57.12%) females population. The density of population in the area was 78 persons as per 2001 Census which increased to 92 persons per sq km. (2011). The sex ratio of the district seems to be improved as per 2011 as compared to 2001 Census i.e., 926 females per 1000 males as per 2001 to 951 females per 1000 males as per 2011 Census and the country's sex ratio of 940 females per 1000 males. The literacy rate in the district was

57.70% as per 2001 Census which has increased to 69.25% of which 76.14% is for males and 62.00% is for females as per 2011 Census.

Out of the total population in the district, 40.10% are workers of which 50.23% are male workers and 29.44% are female workers, while, 59.90% are non-workers. The workers are categorized as Cultivators (58.16%), Agricultural labourers (15.90%), Household Industry workers (2.57%), and other workers (23.37%).

The population characteristic of the district is predominantly tribal and out of the total population, Karbi constitute the major tribe and highest proportion. The other ethnic groups of the district are the Bodos, the Dimasa, the Rengma Nagas, the Mizos, the Paite, the Hmars, the Kuki, the Thados, the Garos, the Rabha,the Man (Tai speaking), the Hajong, the Lalung, the Mech and the Sonowal Kachari, and other non tribal groups namely, Tea Tribes, Assamese, Bengali, Nepalese and also other minor groups of Hindi speaking people migrated from different parts of the country. The majority of the population of this district is Hindu (80.1%). Other prominent religion is Christian (16.5%) and Muslim (2.12%). The rest of the religions constitute less than 1% of the total population of the district.

The district is comprised of 2712 inhabited villages, 02 Administrative divisions, i.e. East and West division having their H.Q at Diphu and Hamren respectively, 03 Civil divisions, viz, Diphu, Hamren and Bokajan, 04 Revenue Circles, viz, Diphu, Phuloni, Silonijan, and Donka, 20 Police stations, 03 Sub divisions, 06 Town Committees and as many as 11 Community Developmental Blocks (2011).

Table 1.6

Important Features of Population in Assam and Karbi Anglong District (2001 and 2011)

Head	Unit	As per 2001 Census		As per 2011 Census	
		Assam	Karbi Anglong	Assam	Karbi Anglong
Population	No. of Persons	2,66,55,528	8,13,311	31,205,576	9,56,313
Decadal Growth	Percentage	18.85	22.57	17.07	17.58
Density	Per sq.km	340	78	398	92
Sex Ratio	Female per 1000 male	932	926	958	951
Literacy	Percent	63.25	57.70	72.19	69.25
Urban Population	Percent	12.90	11.30	14.1	11.81
Rural Population	Percent	87.10	88.70	85.91	88.19
S.C Population	Percent	6.85	3.63	7.15	4.70
S.T. Population	Percent	12.41	55.69	12.45	56.33

Source : District Census Hand Book, Karbi Anglong District, Series-19, Part XII-A, Census of India-2011, Assam

Table 1.7

Town-wise Population of Karbi Anglong District.

Sl No	Name of the Town	1991 census	As per 2001 Census				2011 Census
		Population					
		Total	SC	ST	Others	Total	Total
1	Diphu (C-Class III)	39,551	1,366	20,288	30,656	52,310	61,797
2	Bokajan (D-Class IV)	11,008	223	829	13,167	14,219	19,877
3	Donkamokam (E-Class V)	8,147	370	5,705	2,165	8,240	9,116
4	Dokmoka (F-Class VI)	4,091	53	2,177	2,434	4,664	5,478
5	Hamren(F-Class VI)	3,771	132	6,233	2,080	8,445	8,747
6	Howraghat (F-Class VI)	3,718	399	581	3,072	4,052	5,443
7	Laharijan Natun Bosti (CT)	_	_	_	_	_	2,508

Source: District Census Hand Book, Karbi Anglong District, Series-19, Part XII-A, Census of India-2011, Assam

2.9 SOCIO-ECONOMIC CONDITIONS

It is generally understood that any policy for development must try to utilize the inter-relationships among various socio-economic amenities/facilities in relations to space. Large portions of our rural areas are deprived of many basic amenities/facilities due to one or a combination of factors related to social as well as historical constraints. In the context of development of socio-economic conditions, the locational aspects become extremely important. An understanding of functional inter-relationships in space therefore is very much essential towards the development of socio- economic conditions of an area.

The Karbi Anglong district which is situated in the central part of Assam has been taken into consideration for testing the validity of the facts and its major functional facilities and socio- economic conditions of the area. In general, the district, though is primarily formed of stable Gondwana massif and granite rocks, where jhuming is the main dominant activity, the entire socio-economic structure is extremely weak and are concentrated on a few locations only for which the local resources cannot easily be utilized for the development of the area. As a result, the rate of development in the district may be observed very slow rather than the rate of development of the other parts of the plain/hills areas of the country. It is obvious that the distribution of socio-economic as well as functional facilities in the district is comparatively lesser than the other parts of the state. For instance, more than 80 per cent of the total working force of the district is engaged in primary sector (agricultural activities), while very few working force is employed in secondary sector. On the other hand, the present rate of literacy in the district as per 2011 census (69.25%) is also low compared to other districts in the state. Thus, the main emphasis should be given to establish and develop the facilities related to educational facilities in the area. Moreover the children population requires educational facilities which are very less in the districts.

Under such situation, therefore, there is a need of describing the location patterns of functional facilities and centrality patterns in its spatial set up and socio-economic conditions for overall development of the area. In fact, the whole systems of process of development in the district should be changed in order to avail these existing facilities/activities in orderly manner. It is highly noticeable that the road communication for instance, is not at all developing in the entire district except the National High way

and State Highways. No good roads connectivity in the West Karbi Anglong is available. It is also observed that, in the district, transport technology is not adequately available, even if it is available; it is not frequently applied because of insignificant number of extension services, finance and marketing and so on. The availability of technology, research and demonstration on the local basis to facilitate adoptions are highly required in the district.

2.10 TRANSPORT AND COMMUNICATION

The movement of man, material and ideas from one place to other is the function of communication activities (Chand, 1979)[9]. In fact, the movement of ideas, goods and of people by means, ranging from walking to telecommunication makes possible the specialization of location. Communication logically can be classified into two broad categories: Physical and Human. Physical communication consists of roads, railways, post and telegraphs, aviation etc. while; Human communication comprises mass communication, institutional communication and face to face communication (Sinha, 1972)[10].

2.10.1 ROADS

The district of Karbi Anglong bears a distinct hilly and rugged topography in Assam. Due to its total geographical isolation, transport system has been a major bottleneck for the economic progress of the district. There are still many places in the district which has got transportation bottle necking thereby making the developmental activity almost stagnant.

The transport and communication system throughout the district is yet to be developed although the district is connected with other districts through various routes especially in the areas of West Karbi Anglong. The National High Way-39 passes through Numaligar, Lahorijan, Bokajan and Borpathar to connect Dimapur of Nagaland state. While, National High way-36 passes through Doboka, Dokmoka, Langhin, Bakalia, Manja and Dillaji to connect Nagaland State through Dimapur.

The internal routes of the district are under Public Works Department (PWD). For nearly 50% of the villages the nearest bus stop is at a distance of about 3 to 5 km or more.

As per Economic Survey, Assam, 2011-2012, there is 1481 Km of Black Topped and 2828 Km of earthen/graveled PWD roads in the district of Karbi Anglong. There are

altogether a length of 337 Km State High ways, 561 Km major District roads, 3341 Km rural roads, and 70 Km urban roads in the district.

2.10.2 RAILWAYS

Rail transport occupies an important place in the transport sector of Karbi Anglong District. The rail route of the district constitutes only 3.76% of the state rail route. The N.F.R passes through the district touching only a few points viz- Hawaipur, Lamsakhang, Borlangpher, Langsoliet, Nilalung, Diphu, Daldali, Dhansiri, Rangapahar, Khatkhati, Bokajan and Sorupathar.

2.10.3 POSTAL AND TELECOMMUNICTIONS

The Postal and Tele communication facilities particularly with the latest mobile network telephone sources have been spread throughout the district. The district also has a wide network of postal facilities. The Head Post Office with computer facilities located at the heart of the town Diphu besides Diphu Govt. College Sub Post Office and Manja Sub Post Office is the main Post Office and has been catering the need of the common people of the region. The present postal facilities provide Saving Bank facilities under different schemes like Post Office Savings Account (POSA), Post Office Recurring Deposit (PORD), Kishan Vikash Patra (KVP), Postal Life Insurance (PLI) etc.

The Telecom services at the same time, is also expanding in the region in recent years with the installation of modern computerized systems. There are about 10 (ten) numbers of telephone exchange office located at various locations like Manja, Howraghat, Dokmoka, Parokhowa, Balipathar, Sarihajan, Dillaipajar and the rest are located in West Karbi Anglong District. Besides, internet facilities are also available in both urban, semi- urban and even in rural areas of the district.

Besides these above mentioned facilities, many daily, bi-weekly and weekly news papers both national and local published in various languages within the district are also circulated throughout the district. A local cable KAT channel and a Radio station are in operation in the district.

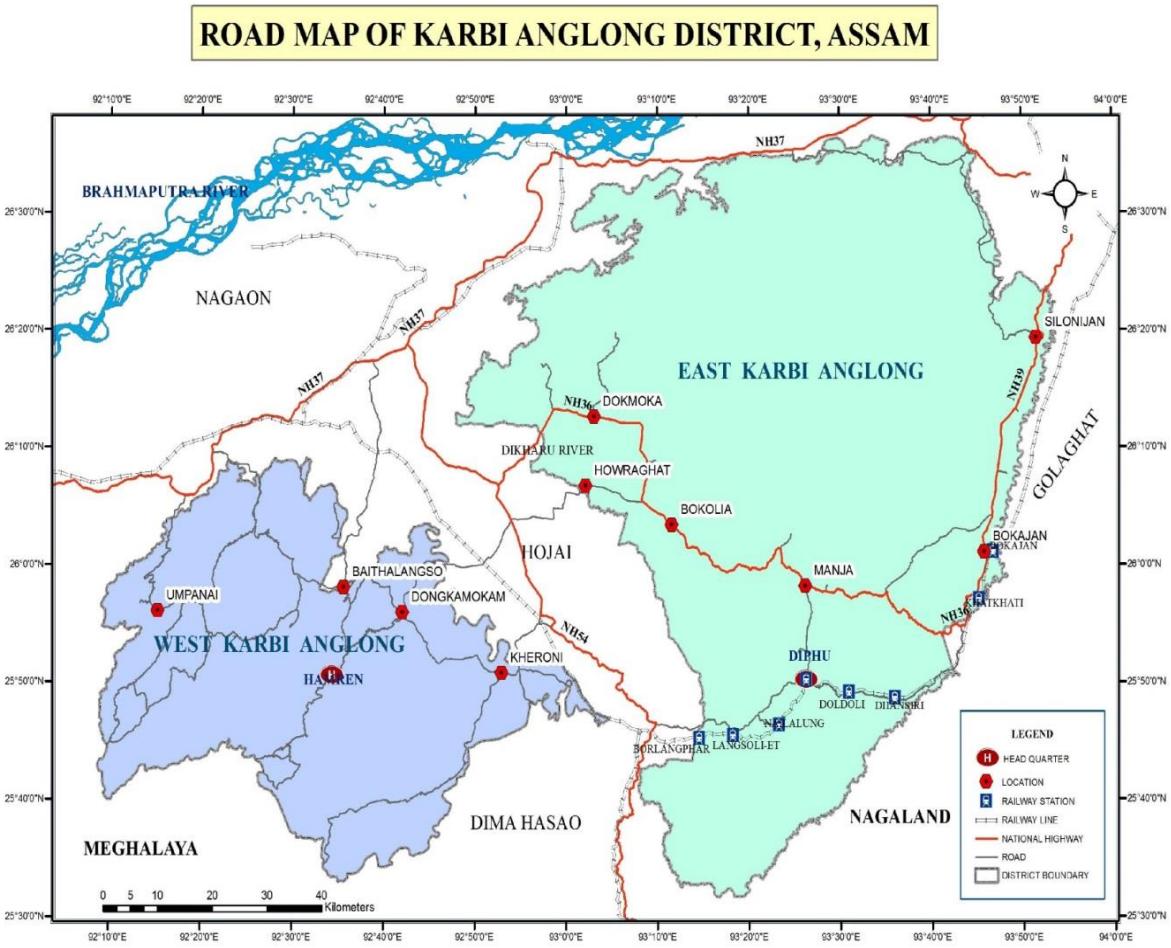

Fig: 1.11

Source: Survey of India

KARBI ANGLONG

ROAD AND PHYSIOGRAPHY MAP

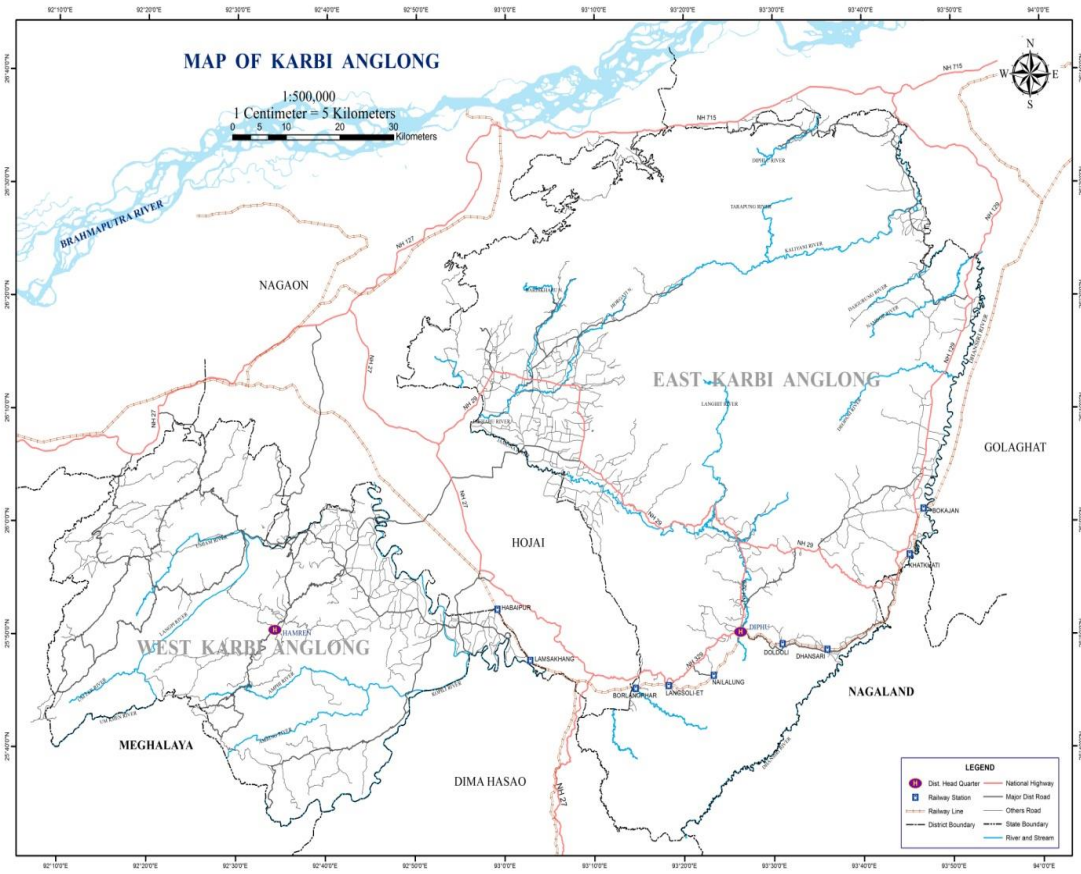

Fig: 1.12

Source: Survey of India

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CHAPTER - III

NATURAL AND HUMAN RESOURCES AND THEIR DISTRIBUTIONAL PATTERNS

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NATURAL AND HUMAN RESOURCES AND THEIR DISTRIBUTIONAL PATTERNS

The bountiful resources are the gift of nature. These resources are the bases of both security and opulence; they form one of the primary assets to the nation's economy. They are in fact the result of human culture; the materials of the physical environment become resources only when they fulfill a human want or need. "Natural" resources, therefore, exist only in conjunction with human culture.

Many studies on resources have largely been made by Economists and other Scientists, especially, by Geographers, yet there exist a number of misconceptions in identifying resources with substances or tangible things and invisible or intangible aspects – such as knowledge, social harmony and health etc. Dictionary defines of the word "Resources" as

i) That upon which one relies for aid, support or supply;
ii) Means to attain given ends, and
iii) The capacity to advantage of opportunities or to extricate one from difficulties.

Evidently, resources presuppose a person. They are an expression or reflection of human appraisal. The appraisal finds that something conserve as means to given ends, that one can rely on it for aid, support, or supply. The resources do not necessarily exist outside the appraiser but can be lodged within him. Evidently, there are subjective or internal resources as well as objective or external resources.

Zimmermann (1951, p.15)[1] defines, "Resources are not they-- become". It is in fact, 'cultural appraisals' (Saver, 1952)[2]. These "Resources are living phenomena, expanding and contracting in response to human effort and behavior. To a large extent they are man's own creation" (Peach and James, 1972)[3]. Natural resources could refer to all living and non-living endowment of the earth but the traditional use confine the term to naturally occurring resources and systems that could be under plausible techno-economic, socio-environment and ecological circumstances. On the other hand, 'Resources' we mean by natural resources are those mineral areas or living things considered useful or of particular value of human culture. Thus, the word "resources" does not refer to a thing or a substance may perform (Zimmermann, 1951, p.9) [4]. In other

words, “resources” is an expression or reflecting human appraisal and relating to a function or operation. A diversity of resources, in fact, may lead to variety of skills and encourage a complex division of labour (Ackerman.1960) [5].

According to Stringer and Davies (1966)[6], resources are primarily classified as:

(a) Natural resources

(b) Human resources, under which both Abiotic (nonrenewable) and Biotic (renewable) resources are classified.

All the materials, elements and forces of the natural environment which man adapts to his own ends are called “Resources”. Natural resources include soils as a basic resources; Minerals such as natural oil, coal, iron ore, gold, uranium, rocks of economic value, forests and natural grasses, animal life, fish and water.

Human resources, on the other hand, are divided in two ways – first, by a study of the actual quantity of the population and secondly, by a study of the quality of population. A quantitative assessment includes the total population, the distribution, density, age groups and sex structure, class structure and the actual percentage of working population. Whereas, a qualitative assessment includes consideration of personality, education, skill, enterprise and ethical values, all of which affects the economic development of a country or a region to a certain extent.

On the basis of distribution, amount, and frequency of occurrences Zimmermann (1951, pp.80-81) classifies the resources as:

(a) Ubiquities – occurring everywhere such as, Oxygen in the air,

(b) Commonalities – occurring in many places, such as tillable soil,

(c) Rarities – occurring in few places, such as tin, zinc, iron etc. and

(d) Uniquities – occurring in one place, such as commercial cryolite.

However, according to geographical classification, Natural resources, resources can be classified into three broad categories. These are:

(a) Land as a resource, and

(b) Human resource.

Natural resources are those materials or elements which are readily available in the natural environment, such as, soil, water, forest, wild life and minerals. If piece of

land, which includes the various environmental conditions on which quality of land is assessed, and considered as resources, the general land conditions and human interactions with them like agricultural, industrial and other activities of man for his better way of living are to be studied for understanding the existing use of available resources. The land potential of an area is also important for proposing balanced development and expanding interaction intensity through balanced spatio-functional analysis/organization.

Human resources are both the most dynamic and the most potent; they are also the precious because they combine the task of production agent with the end object of the entire process of development. They constitute the end values to be achieved in the process. For skill labour, educational, medical, postal and communication facilities are essential to study.

Though the study on resources has largely been made by many economists, and geographers especially on resource distribution, yet the methodological aspects in the study of resources have changed in the recent past. The studies on resources in the early centuries were confined mainly to its identification and consumption only. However, that time emphasis were not given to their utilization, evaluation, conservation and management in relation to man and its environment and consequently, the development processes were never realized. The significance of the multi-dimensional nature of the development phenomena was not adequately recognized until rather recently. In the recent past, the study on resources got a new dimension in the methodological approaches. It was felt that planning of natural resources is the only solution to multi-pronged agro-economic problems and their role in the economic development. Therefore, there is a need to change the methodological approaches towards understanding the role of resources and the factors that are needed in planning and decision making processes for the balanced economic development in a region. Further, this approach highlights the emerging co-crisis and need for conservation of resources. It helps us to understand the importance of relations between man and his activities and further helps us in understanding the existing basic resources with references to its description, analysis, utilization and conservation.

In the present chapter, the resource personality of the district is analyzed in detail for preparing the spatial strategy of the resource utilization.

3.1 NATURAL RESOURCES

On the basis of resource availability in the study area, the natural resources may be explained briefly in the following manner:

3.1.1 SOILS

Soil as a renewable resource is comprised of organic materials and inorganic components such as weathered rock particles along with water, and gases, mainly oxygen and nitrogen. It provides the home for bacteria, fungi and a variety of other organisms, as soil is the cradle of all crops and plants play the utmost importance and helps in the development of the society. Both in agricultural as well as in economic activities, soils rather their types provide the bases for development. Soil is also important for all types of planning. Soils and their properties are also influenced directly by topography, geology and climatic conditions of the area.

Man as an active user of soil may use the soils with the purpose of obtaining profit and many a time without carrying much about its future fertility. The importance of soils has now been realized and, therefore, keeping the soils in sound health is the primary concern of the farmers and soil scientists all over the country.

The hill soils of Karbi Anglong are very important resource as the economy is mainly agro-based. Usually these soils are red loam. The soil of the region contains high quantity of organic matter and nitrogen. It is due to withering process of the hills which being washed away by rain. As the soil is acidic and contained organic matters and nitrogen has help in producing many crops like paddy, sugar cane, cotton, mustard and maize including fruits like orange, pineapple, citrus, banana etc. The soils of the region belong mainly to the category of hill soils developed on the Archaean parent material and are influenced by hot and humid climate and a rich vegetal cover. Heavy soil erosion due to the regular practice of jhum cultivation in the district has caused the exposure of granite and gneissic rocks which are a common site in the entire lower slope of Hamren plateau facing the Rongkhang plains and the low hills and ridges in the plains of Dokmoka.

The plains of the region especially the river valleys of Kopili, Kolong, and Dhansiri, are mostly dominated by new alluviums which are deposited every year as a result of summer flood. These plains and the river valleys constitute the best agricultural

fields of the district. The new alluviums soils in North India are popularly known as Khadar. These New alluviums are somewhat sandy, medium in porosity due to fine texture and presence of some amount of clay, grey in colour and excellent from the agricultural point of view.

Deposits of old alluvium are found along the western portion of the Hamren plateau and the northern portion of Chenghe Arnam plateau. Old alluviums, also called Bhangar in north India, are composed of coarse gravel and are found above the flood level. Its texture varies from coarse to clayey loam with a varying degree of Nitrogen. These soils are used for the cultivation of hill rice, fruits, vegetable and tea in Diphu sub-division adjoining the Nagaon and Golaghat districts.

Laterites and lateritic soils occur in southern parts of Hamren sub-division and western part of Diphu sub-division. These occur both in the high land areas and in the mountain valleys. The surface soils are generally pale red to reddish brown in colour. The texture of top soil mostly varies from sandy to loam soil and as such prone to soil erosion. The soil type, its texture and depth varies from place to place depending upon slope, elevation and vegetative cover. The soil, in general is sandy loam with good depth except on eroded hill slopes.

On the whole, Red loamy soils mixed with clay which is suitable for production of various types of potatoes, grams and hill paddy covers about 70% of the area of Diphu Sub-division. Sandy and clayey soils are found in the entire Socheng area in the southern part of Hamren Sub division. The old alluvial soils on the other are suitable for tea plantation; fruits and vegetation are found in western part of Rongkhang plain and in the extreme northern most part of the Diphu Sub division. The sandy and alluvial soils are found in the eastern part of Rongkhang plain, Jamuna valley and also in some part of Dhansiri plain and are suitable for the cultivation of rice and jute. Thus the type of soil of the district is closely related with the socio economy of the people entire people of the district.

3.1.2 WATER RESOURCES

Water as natural resources is one of the most essential resources for man. As a physical substance, it is unique in a number of respects and is quite indispensable for the existence of life on the earth. To a large extent, the economy of the nation depends on the

availability of water resources. It is not merely a chemical composition of H_2O in scientific terminology, but in its natural conditions, physical properties, types and quality and movements etc. exhibit a complex relationship. Water is found in various aggregatory, liquid and in moisture conditions which occur in different forms in different timings. As it is one of the basic resources, it is most important factor for development and growth of plants, fertility of soils and for agricultural production. Availability of water and application of right quantity of it at the right time are vital for profitable results from agriculture. As a matter of fact, due to variation in the topography and climatic conditions of the study area, water supply is not sufficiently available for agriculture. Underground water is also not easily accessible for proper utilization because water table is very low. Moreover, the area has Rain shadow effect to the extreme most eastern part of Hamren Sub division and the bordering areas of the Hojai Division around Lanka and Lumding.

It is, therefore, necessary to state that, water is one of the most important elements for all kinds of lives. In view of the importance of water and its better utilization for agriculture, development of irrigation has become an issue of inescapable importance in Indian Planning. Many developmental activities, management processes of the nation have to depend on water resources. As a renewable resource, it has been utilizing for multidimensional activities, such as, agriculture, industries, means of transportation, generation of power, and above all, daily uses of human beings. Both surface as well as underground water resources are of immense use in a number of respects.

There are more than a dozen river and tributaries together in the district. The chief rivers namely Kopili, Amreng, Borpani (Karbi Langpi), Kaliani, Jamuna, Dhansiri, Dikharu, Nambor, Deopani, Longnit, Patradisa, Doirang and Diphu rivers are equally the main sources of agricultural activities and human activities or survival. At the same time, it is also the source of water resources in the district.(**Fig.1.8**). The entire district though compact with the net work of rivers and tributaries, one can hardly find that except one or two main streams, other streams remain almost negligible during winter season for which the district has very limited and minimum water facilities compared to the other neighboring district. The source of water in the district is perennial in nature, but seasonal in function.

LOCATION OF PHED WATER SUPPLY SOURCES

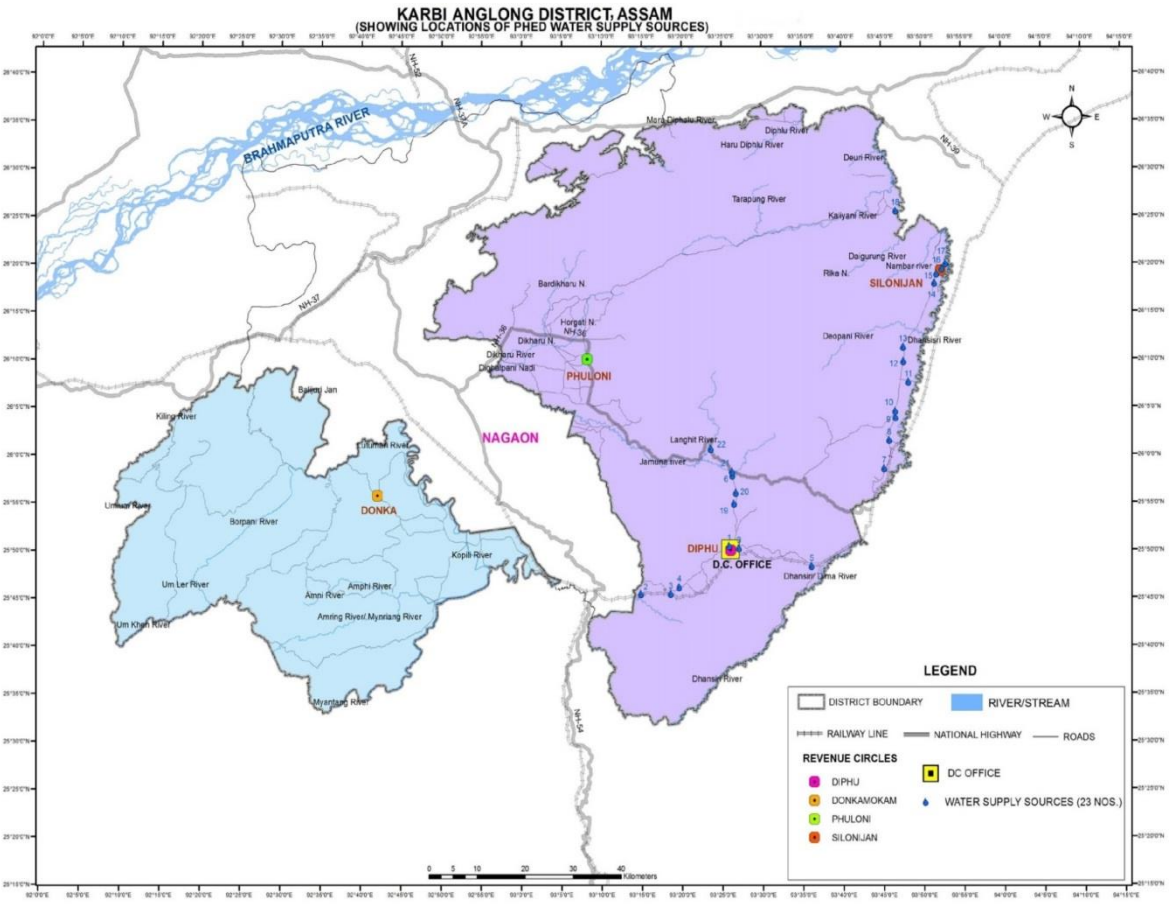

Fig 1.13

Source: Survey of India

3.1.3 FOREST RESOURCES

Forests are mainly associations of plants, predominantly trees. They constitute one of the major forms of natural landscape. Forests are another type of land-based natural resources, providing such things as fuel, timber, paper, wild life habitats and recreation. Forest resources are recognized as renewal natural resources and confer multiple benefits and play an important role in the economic development. The forests constitute a powerful ecological unit having vital environmental significance. They influence local and regional climate by moderating the same, maintaining soil mantle, purifying air and helping in ensuring continuous flow of clear water. Forests help augment natural water supply, preserved wildlife, control floods and prevent soil erosion,

besides providing valuable raw materials for a number of industries. It can therefore, be considered as the most crucial life support system as they consume water and soil on which food production depends in the region.

Nature has bestowed forest resources unreservedly to the dwellers of this region. Hence, uncountable quantum of forest products such as rubber, coffee, black pepper, augar, sal, Bonsum, Sand Gravels, Boulders, lac, Resin and multifarious medicinal herbs are freely and abundantly traceable throughout the length and breadth of the district. It is observed that, there is high potentiality of exporting of some of these forest products found in the district even to outside the state.

The hill area of Assam forest covers about 34% of the total geographical area of the region against the regulated forest coverage of 60% as fixed by the National Forestry Policy, 1952. As per the State of Forests Reports (SFR), 2001, published by the Forest Survey of India, the total area under forests in Karbi Anglong District was 7,97,200 hectares constituting 76.4% of its geographical area. The forest of Karbi Anglong District is rich in bio-diversity. The district is endowed with rich luxuriant vegetative comprising of trees, shrubs, herbs and grasses. The district is known for its diverse and most extensive lush green forest. Some of the plants species found in the district are highly prized commercially; some have aesthetic value while others are used for making dwelling huts by local people. Besides, many plants have been used for generations in either curing ailments, making local brews, as species on curries and in religious ceremonies.

The important forest types available in Karbi Anglong District are-

a) Moist semi-evergreen forests
b) Moist mixed deciduous forests
c) Riverine type, and
d) Mixed forests with bamboo.

Moist semi evergreen forests are most widely prevalent in the District and contains varieties of both evergreen and semi evergreen forest species. Different varieties of valuable timbers like teak, badam, amari, cham, tita chapa, bansum, hillock, gomari, koroi, nahor, bhelu, etc. are found in the region.

Moist mixed deciduous forests covering a vast stretches of area is found in the western and southern hills of Diphu sub-division. The important species found in the region are Sal, Sagun, Sida, Haldu, Simul, Bohera, Azhar and Ghogora etc.

The Riverine type of forest is found mostly in the areas occupying the vicinity of rivers and streams having recent alluvium soil.

The other type of mixed forests and bamboo are found in the areas of East Division and Hamren Division. Other common forest products of second category like fire wood, thatch, cane, bamboo, patidoi, phulijaru (broomstick), dhuna, and medicinal herbs -Neem, Chalmugra, Chandan (sandal), Agaru, Atar, Tulsi, Citronella, and Amla are also found in the forest of Karbi Anglong District. The district is also rich in varieties of wild life such as wild buffaloes, elephants, tigers, deer, beers, monkeys, green pigeons, mynas, great hornbills, wild ducks, wild pigs etc. Some rare species of reptiles such as lizards, pythons and pangolin (banrou) are also found in the district. The bordering hilly areas of Karbi Anglong adjacent to the Kaziranga National Park, provides shelter to the wild life during flood and rainy season.

The forest areas of the district are managed both by the State Govt. and the Karbi Anglong Autonomous Council authority respectively. Under the Autonomous Council, the forest areas are managed through its territorial divisions namely- (i) Karbi Anglong East Division, Diphu (ii) Karbi Anglong West Division, Diphu, and (iii) Hamren Division. Some forest areas are however, kept as unclassed State Forests. Some of the large state Reserved forests in Karbi Anglong are Dhansiri RF (770.38 sq.km), Mikir Hills RF (221.81sq.km), Kaliani RF (208.96 sq, km) and Nambor West Block RF (166.33 sq. km). It is worthwhile to mention that the Dhansiri RF of Karbi Anglong is the largest forest areas in the whole of the region. In the case of Council managed Reserved Forest, Sarchim RF (146.00sq.km), Miyungdisa RF (143.92 sq.km), Longnit RF (117.62 sq.km), and Khonbamon RF with an area of 105.50 sq. km are among the main Reserved Forest area of the district. **(Table 2.1)**

Table 2.1

Area Showing Forest Coverage in Karbi Anglong District

A. Karbi Anglong West Division

State Reserved Forest

Sl. No	Reserved Forest (R.F)	Area (in Sq. Km)
1	Dhansiri R.F	770.38
2	Daldoli R.F	123.32
3	Disama R.F	112.15
4	Kaki R.F	121.49

District Council Reserved Forest

Sl. No	Reserved Forest (R.F)	Area (in Sq. Km)
1	Miyungdisa District Council R.F	143.92
2	Tamulbari District Council R.F	13.86
3	Englongkiri District Council R.F	74.32
4	Borlangfer District Council R.F	77.31
5	Matipung District Council R.F	33.00
6	Langcholiate District Council R.F	1.60

Proposed Reserved Forest

Sl. No.	Reserved Forest (R.F)	Area (in Sq. Km)
1	Hafjan Proposed R.F	35.25

Wildlife Sanctuary

Sl. No	Wildlife Sanctuary	Area (in Sq. Km)
1	Marat Longri Wildlife Sanctuary	451.00

Unclassed State Forest

Sl. No	Unclassed Forest	Area (in Sq. Km)
1	U.S.F Under Karbi Anglong West Division	469.24

B. Karbi Anglong East Division

State Reserved Forest

Sl. No	Reserved Forest (R.F)	Area (in Sq. Km)
1	Mikir Hills R.F	221.81
2	Kaliani R.F	208.96
3	Nambar R.F (North Block)	53.09
4	Nambar R.F (West lock)	166.33
5	Sildharampur R.F	15.75
6	Jungthung R.F	32.51
7	Chelabor R.F	33.54

District Council Reserved Forest

Sl. No	Reserved Forest (R.F)	Area (in Sq. Km)
1	Longnit District Council R.F	117.62
2	Patradisa District Council R.F	67.33
3	Hidipi District Council R.F	20.08
4	Jamuna District Council R.F	11.30
5	Mahamaya District Council R.F	5.58
6	Khonbamon District Council R.F	105.50
7	Haithapahar District Council R.F	54.39

Proposed Reserved Forest

Sl. No	Reserved Forest (R.F)	Area (in Sq. Km)
1	Kaziranga Proposed R.F	33.88
2	Kalapahar Proposed R.F	9.77
3	Parkup pahar Proposed R.F	27.73
4	Langlokso Proposed R.F	534.71
5	Western Mikir Hills Proposed R.F	173.38
6	Bokajan Proposed R.F	24.79
7	Dolamara Proposed R.F	20.18
8	Lahorijan Proposed R.F	37.51
9	Borjuri Proposed R.F	139.00
10	Tikok Proposed R.F	25.70

Wildlife Sanctuary

Sl. No	Wildlife Sanctuary	Area (in Sq. Km)
1	Garampani Wildlife Sanctuary	6.00
2	Nambor Wildlife Sanctuary	37.00
3	East Karnbi Anglong Wildlife Sanctuary	221.81
4	North Karbi Anglong Wildlife Sanctuary	96.00

Unclassed State Forest

Sl. No	Unclassed Forest	Area (in Sq. Km)
1	Unclassed State Forest Under Karbi Anglong Division	1294.00

C. Hamren Division Reserved Forest

State Reserved Forest

Sl. No.	Reserved Forest (R.F)	Area (in Sq. Km)
1	Amreng R.F	56.94
2	Rongkhang R.F	33.39
3	Jokota R.F	12.35

District Council Reserved Forest

Sl. No	Reserved Forest (R.F)	Area (in Sq. Km)
1	Sarchim District Council R.F	146.00
2	Kolonga District Council R.F	17.35
3	Amren 1st District Council R.F	5.80
4	Amren 2nd District Council R.F	56.30

Proposed Reserved Forest

Sl. No	Reserved Forest (R.F)	Area (in Sq. Km)
1	Punja Proposed R.F	4.00
2	Umjakini Proposed R.F	36.80
3	Balasor Proposed R.F	82.79
4	Chinanadi Proposed R.F	19.87
5	Amsolong Proposed R.F	74.73
6	Rikhonglong Proposed R.F	18.25

Unclassed State Forest

Sl. No	Unclassed Forest	Area (in Sq. Km)
1	Unclassed State Forest Under Karbi Anglong Hamren Division	2473.20

Source: Forest Office Karbi Anglong West Division (2016),

It is however observed that the forest being an important resource is susceptible to large scale of depletion and degradation and so as the case of Karbi Anglong district. The forested area of the region is under tremendous pressure due to excessive extraction of raw materials and wide spread practice of shifting or jhum cultivation. Moreover, intervention of human activities in achieving its daily needs has badly affected the forest resources. With the passage of time due to degradation and reckless cutting of forests either for jhum cultivation or construction of buildings etc. it has lost its natural character. Further, due to the dependence on the forests for their livelihood in recent times especially by the rural poor families, most of the dense forested areas in the district are being cut down and practically only a small patch of the area is now left as forest area. Excess felling of trees for commercial purposes as well as age old practice of jhum cultivation is greatly endangering the environment and finally the entire area is threatened with ecological disaster. Therefore there is a need of proper strategies to deal with especially in safeguarding the depletion of the forest. Present practices of commercial exploitation of forest produce and jhum cultivation may require scientific planning as this activities affects the water resources

3.1.4 MINERAL RESOURCES

Availability of minerals provides a base for the economic development of a region or a country. Minerals are required to make various things, like tools, machines and raw materials for manufacturing various consumer products. In the present day time, for rapid industrial development, modernization of agricultural as also for modern living, the significance of minerals cannot be overstated. From the angle of modern industries, the vital ones are coal, petroleum and iron ores. Many others like ores of manganese, chromites, aluminum, copper, lead, zinc, phosphates, and potash are no less important.

Being almost entirely covered by a vast hilly tract, the Karbi Anglong District possesses many minerals of much economic values. Varieties of minerals like coal, limestone, feldspar, mica, china clay (Kaolin) etc., are found in abundant quantity in different regions of the district.

The important areas of the district where coal seam are located are Koilajan about 25km. West-North-West of Dimapur, Silvetta, Longboi, Shemda, Kaliani etc., Lime stones of high grade occur in the eastern part of Karbi Anglong. Among all the occurrence, Koilajan is the largest covering a deposit area of 12 sq. km. having five different limestone bands[1]. Saini Langso, Sarihajan, Bor Sarihajan, Lumbha and some places of Kopili rivers have also been reported to have limestone bands and the total reserve for the whole region is estimated at 154 million tones. The limestone in Dilai Hills is being used in manufacturing cement in Bokajan Cement Plant. Lime stones found in the area are also used in production of many chemical substances. Among the resources, Coal is also found at Kaliajan and Silbheta. There are also more deposits of coal at Khunbamon. Further, Copper in limited quantity is found in border area of Karbi Anglong. The China clay i.e. Kaolin the basic raw material for pottery industry is reported to have occurred in Silvetta area. The deposit of china clay at silbhetta is estimated to be several lakh of tones. Hard granite or gneiss extremely good stones for making road boulders, metals, chips, etc. as well as sands for concrete works are extensively found in Hamren Sub Division particularly in Baithalangso and Dongkamokam areas. Good quality of sand for construction works is found in Manja and Bakulia area. Clay is also found in abundant quantity in Karbi Anglong for making bricks, glass and pottery. The occurrence of oil and natural gas has been reported from near Koilajan.

3.2 LAND RESOURCE

Land as a renewable resource may be assessed in many ways. The basic determinants of what makes land a resource are found in the composition of soils and the environmental conditions. The land resource as a composition of soils is of great importance in landscape ecology and forms the basis for all plans in agriculture and forestry. In fact, the agricultural activities and functions related to the forests are directly associated with the land resources. Especially in the study area, the favorable soils, water and climatic conditions intensify the resource availability and its capability for its further uses. The study of land resources of the Karbi Anglong District can easily be done by interpreting the conditions of the general land-use and especially of the agricultural land use; so that the main functions related to the agriculture and other associated activities may be identified for balanced spatio-functional facilities of the study area. The following passages analyze the main characteristics of land use of the district.

3.2.1 GENERAL LAND-USE

The general land-use patterns have significant characteristics. The land use patterns of any region are the outcome of geomorphic features, climatic variations, pedological differences and socio-economic conditions (Ali, 1984, p.32) [7]. In a given milieu, man as an active agent modifies the landscape and uses it to fulfill his needs and the types of living which are presented by social values and certain institutional controls tends to create different patterns of land use within the limits imposed by different agro-ecological situations. The impact of physical factors is interwoven with socio-economic conditions from which the farmers cannot easily be spared for geographical investigation of contemporaneous land-use patterns and changes therein (Ali, 1984. p. 34)[8].

It is therefore worthwhile to define the various categories of land-use and their significant characteristics. According to agricultural Census of India, the land as geographically accessible for major use is classified into nine broad categories, namely, forests, land under non-agricultural uses (like Settlements, Ponds, Lakes, Streams, Roads etc.), Barren land, permanent pastures and other grazing land, land under groves and gardens, tree crops, cultivable waste land; fallow land (current as well as other than fallow) and Net area sown. But in the District Karbi Anglong, six are the important categories under which most of the land is being utilized.

The land use patterns of Karbi Anglong District have been explained briefly under the six broad categories. These are-

i) Forest area
ii) Land not available for cultivation
iii) Barren and uncultured land
iv) Net Area sown
v) Total cropped area, and
vi) Area sown more than once.

On account of the relief pattern of the district, extensive coverage of forests area, undulating plain surface and the impact of rain shadow zone, only 15% of the total geographical of the district is under total cropped area. The **Table 2.2** which depicts the general use patterns reveals that out of the total geographical area of the district, net area sown covers 10% only. On the other hand, there seems to be no land area has been put as fallow land as well as fallow other than current fallow. The category of land as Land not available for cultivation occupies about 45% of the area of the district.

Table 2.2

Land-use Patterns in Karbi Anglong District, 2010-2011

Sl No.	Classification of Land	Area in Hect.	Area in Sq.km.	Area in %
1	Total Geographical Area	1043400	10434	100
2	Forest Area	319294	3192.94	24
3	Land not available for cultivation	587707	5877.07	45
(a)	Land put to non agricultural used		-	-
(b)	Barren and uncultured land	587707	5877.07	45
4	Other non cultivated land excluding fallow land		-	-
(a)	Permanent pastures other grazing land		-	-
(b)	Land under misc. trees, grooves etc.		-	-
(c)	Cultivable waste land		-	-
5	Fallow land		-	0
(a)	Fallow other than current fallow		-	-
(b)	Current fallow		-	-
6	Net area sown	126399	1263.99	10
7	Total cropped area	202564	2025.64	15
8	Area sown more than once	76165	761.65	6

Source: District Census Hand Book, Karbi Anglong, Series-19, Part-A, Census of India-2011, Assam

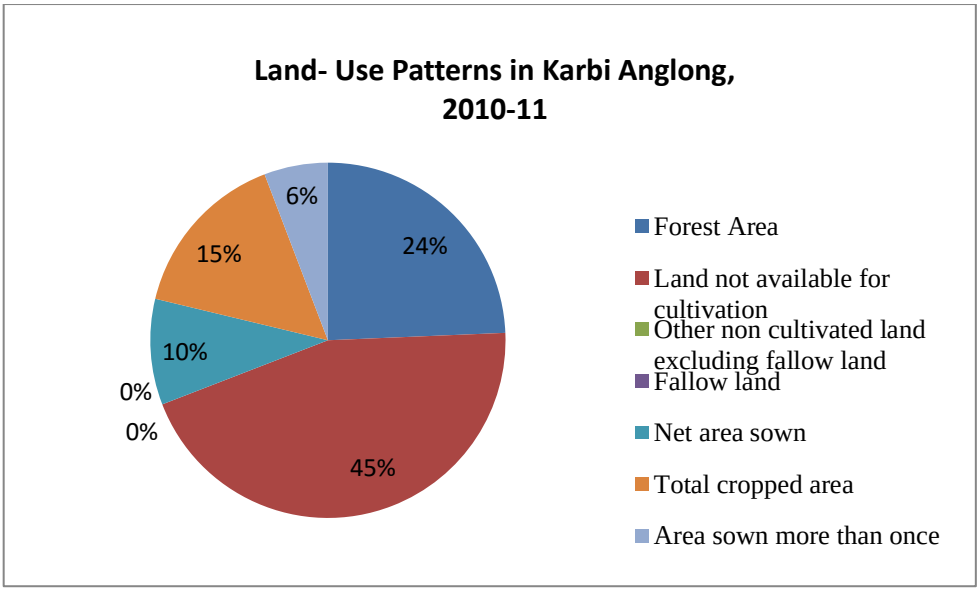

Fig.1.2

3.2.2 AGRICULTURAL LAND USE AND CROPS

Agriculture is the main source of income of the people of the region. The source of economic development of the district is highly dependent on its agricultural and allied activities. More than half of its population is engaged in agriculture in order to earn their livelihood. The district with its rugged and undulating nature of topography has its own peculiarities in the system of their cultivation.

The District Karbi Anglong like other parts or region of Assam produces a variety of crops. The type of cultivation of crops varies from place to place according to the variation of relief, rainfall, soil etc. The people living in the district generally prefer to cultivate single crop, i.e. mono crop. They rarely follow double or multiple cropping systems. They usually practice terrace cultivation in order to protect and preserve soil and moisture condition.

The varieties of crops grown in the district are mainly food crops, fiber crops, oil seeds, pulses, sugarcane, ginger, fruits, vegetables etc. among which food crops is the dominant crops. Among the food crops, paddy occupies the maximum area of land while Jute is the most important fiber crops which are grown mostly for commercial purpose. Apart from the main food grains, oil seeds like rape, mustard, and seasamum are cultivated in the district. Maize, Cotton, Potato, Sugarcane and Wheat are also grown in the district.

In the district, varieties of pulses are also grown in both kharif and rabi seasons.

Varieties of fruits like banana, orange, pineapple, lemon and mango etc are also extensively cultivated and available in some parts of the district.

Out of the total geographical area of the district only 11.8 % of the land was put to agricultural uses during 1991-2000 which has marginally increased to 15% as total cropped area during 2010-11. Agriculture being the single largest contributor to the District Domestic Product (DDP) accounts for about 44.91% of the total DDP of Karbi Anglong. About 73% of the total working for, 59% as cultivators and 14% as agricultural labor were engaged in this sector. As per 1971 census, the total numbers of cultivators were 91,036 and agricultural laborers were 8,111 whereas the number of cultivators has increased to 1, 93,879 and the number of agricultural laborers to 45,462 according to 2001 census. This number of cultivators as well as the number of agricultural laborers has however increased to 223,020 (58.16%) and to 60,953 (15.90%) respectively as per 2011 census.

3.3 HUMAN RESOURCES

The study of human resources is important not only from the point of view of economic welfare but also because of the fact that human beings are both ends and means for economic activities. At one end the number of human being is an asset and on the other, they are liability too, if the number of people is beyond the capacity of the economy to sustain. Obviously, it is essential to know about the size of population in a region at particular time, its growth rate, composition and distribution.

Human responses are no less significant in deciding the general layout of any resources and its distribution. It plays vital role in shaping economy of a country in a particular direction. To this fact, population, in its manifestations of sex ratio, occupational structure and as a labor force (for industries and more particularly for agriculture) is considered an important element. Agriculture as largest occupation depends upon the irrigation which is manned by human and animal power, constitute a vital link in the economic development of a region. Human resources are either directly or indirectly related to the capacity of labor force of an area. The skilled labor which can work efficiently is directly related to the educational and medical amenities/facilities available in the area. Therefore, a proper planning of the locational set up of these facilities is important to study in relation to the population characteristics. Thus, population characteristics of the District Karbi Anglong are described in more details as follows.

3.3.1 POPULATION CHARACTERISTICS

Since 1801, there had been considerable falling off the Karbi population due to the terrible ravages of the "Kalazar". The Census of 1901 showed the figure of this hill folk as 87,046 in the whole province[9]. According to the 1951 Census, the population of the district was 1, 25,797 which increased to 2.25 lakhs in the next Census 1961 where the Karbi population alone shared 41.79 % of the total population of the district. In the year 1971, the total population of the district marked a gradual increase i.e. 3, 79,310 of which male shared 2, 02,347 and female 1, 76,963 persons. Out of the total population recorded, 10,200 (2.69%) were Urban dwellers and the rest 3, 69,110 (97.31%) persons were scattered in 1605 villages. In the Urban centre at Diphu, the sex parity is extremely low. This is perhaps due to the fact that majority of the people in services and business do not keep their families with them in the town for want of suitable accommodation and other congenial infrastructural facilities. Here in the district, the increase rather high rate of growth of population is not due to the increased birth rate of the tribal elements, but due mostly to heavy influx of outlanders.

Although the district as a whole has a geographical area of about 10,434 sq. km is accounted for about 3.05 percent of the total population of Assam, i.e. 9, 56,313 persons out of 31,169,272 according to Census 2011[10]. Earlier, according to 2001 Census, Karbi Anglong District had a total population of about 8, 13,311 as against state's total population of about 2, 66, 55,528 (26638407) Persons. Here the main concentrations of population as per 2001 Census are found in Diphu, Bokajan and Hamren. But according to the census of 2011, the main concentrations of population are found mainly in three emerging towns, namely- Diphu, Bokajan and Donkamokam. Diphu being the Head Quarter of the district of the present study and an urban area shows the highest concentration of population. Among the 4 Revenue Circles for the present study Donka Revenue Circle shows the highest concentration of population with 2,95,358 persons, while, Silonijan is the least populous Revenue Circle having 91,257 persons. Among the C.D Blocks, Rongkhang C.D Block has the highest number of population with 1, 58,035 whereas, the lowest is found in Socheng C.D Block with 27,334. The district comprises 7 towns of which 6 are Statutory Towns and 1 is Census Towns. Among the Statutory Towns, Diphu (TC) is the most populous with 61797 persons while Laharijan Natun Bosti (CT) is the smallest in population with 2508 numbers only.

3.3.2 GROWTH AND DENSITY OF POPULATION

The density of population though varies from Thana to Thana, Circle to Circle and from Block to Block, the district on the whole had 37 and 78 persons per sq.km in1971 and 2001 respectively which has increased to 92 Persons per sq. km. in 2011. The district being a hilly, undulating plain, valleys, and partially considered to be a part of plateau region has a low density of population as compared to the other neibouring districts of the region. In 2011, the district showed 4 densely populated Towns, namely- Bokajan (6626), Laharijan Natun Bosti (5452), Diphu (3750) and Howraghat (3605) persons per sq. km. The least densely populated town is however recorded in Hamren with 875 persons per sq.km. (**Table 2.3)**

So far as the growth rate is concerned, the district recorded a maximum of 22.72% growth in 2001 which has decreased to 17.88 % in 2011. The highest growth as per 2001 Census was recorded in Hamren Town with 124.54% while, the least was recorded in Donkamokam with 0.7%. But in 2011 census the highest growth was recorded in Bokajan with 39.79% followed by Howraghat 34.33% and the least growth were found in Hamren with 3.58 %.(**Table 2.4).** However, among these 7 Census Towns, the growth rate in two towns has shown reverse growth rate i.e., from 124.54% to 3.58% in Hamren and 32.27% to 18.14% in Diphu respectively. The wide variation in the density of population in different parts of the district might have been caused mainly because of presence of vast topographical features especially the hilly terrain, deep gorges, undulating nature of hilly tracts found both in Western as well as Eastern part of the district.

Table: 2.3

Density of Population in Towns (TC & CT) Karbi Anglong District, 2011

Sl No,	Statutory Towns and Census Towns(TC & CT)	Density per sq. km
1	Hamren (TC)	875
2	Donkamokam (TC)	2279
3	Diphu (TC)	3750
4	Bokajan (TC)	6626
5	Laharijan Natun Bosti (CT)	5452
6	Howraghat (TC)	3605
7	Dokmoka (TC)	2739

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

Table: 2.4

Growth of Population in Towns (TC & CT)

Sl.No	Statutory Towns and Census Towns(TC & CT)	Population & Decadal Growth (in %)	
		2001	2011
1	Hamren (TC)	8445 (124.54)	8747 (3.58)
2	Donkamokam (TC)	8240 (-0.7)	9116 (10.63)
3	Diphu (TC)	52310 (32.27)	61797 (18.14)
4	Bokajan (TC)	14219 (28.97)	19877 (39.79)
5	Laharijan Natun Bosti (CT)	-	2508 (0)
6	Howraghat (TC)	4052 (8.75)	5443 (34.33)
7	Dokmoka (TC)	4664 (13,51)	5478 (17.45)

Karbi Anglong District, 2001 to 2011

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

3.3.3 LITERACY LEVEL

The quality of population can be judged from life expectancy, the level of literacy and the level of technical training attained by the people of the country. The level of the literacy in the district was very low in the last few decades. According to 1991 and 2001 Census, the total literate persons in the district was 45.57% and 57.70 % to the total population only out of which 55.55% were male and 34.35% Females and 68.11% were Male and 48.65% Female as per 1991 and 2001 Census. In 2011 Census, the total literate persons have been increased up to 69.25% which is little higher as compared to 2001 Census. In both the years the male literate persons are recorded much higher than the female literate. The percentage of literate persons in the district has however shown a marginal increase in the last two decades (2001-2011) (**Table 2.5**).

Table 2.5

Decadal Literacy Growth in Karbi Anglong District (1951 to 2011)

Year	Male Literacy (%)	Female Literacy (%)	Total Literacy (%)
1951	09.26	02.17	05.9
1961	25.56	06.87	16.92
1971	26.93	10.29	19.17
1981	N.A	N.A	N.A
1991	55.55	34.35	45.57
2001	68.11	48.65	57.70
2011	82.12	64.62	69.25

Source: Office of the Joint Director of Economics and Statistics (Hills), Diphu, Karbi Anglong.

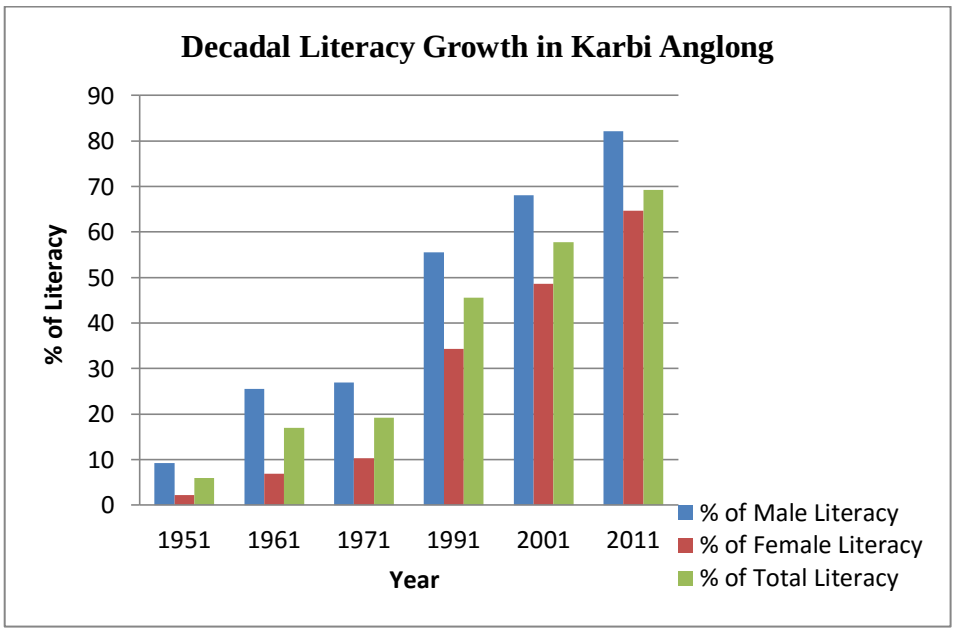

Fig. 1.3

3.3.4 SEX RATIO

The study of population according to sex is also important because the working force mobility and even active participation in the programme which are also influenced by the level of literacy and sex ratio. According to 2001 Census, though the district on the whole recorded 926 females per 1000 males has increased up to 951 females population in 2011.

Table 2.6

Sex Ratio in Karbi Anglong District (1971 to 2011)

Census Year	Assam			Karbi Anglong District		
	Total	Rural	Urban	Total	Rural	Urban
1971	896	912	744	875	885	563
1981*	-	-	-	-	-	-
1991	923	934	838	907	920	804
2001	935	944	872	926	932	878
2011	958	960	946	951	953	940

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

* No census was done during 1981 in Assam

The sex ratio in the district is 926 Females per 1000 males during 2001 little lower as compared to the sex ratio of the State which is 935 only. It is obvious from the above table (**Table 2.6)** that the rate in the sex ratio in the district is comparatively little lower than the increase of the State ratio.

3.4 OCCUPATIONAL STRUCTURE

The study of occupational structure is important not only in analysis of the salient of population distribution but also important in the agricultural studies and socio-economic activities as well. The overwhelming nature of the rural population of Karbi Anglong District is reflected by the fact that more than 49% of the total population of the district is engaged in Primary sector as compared to 17.3% in Secondary and 33.7% in Tertiary sectors. On the other, the agriculture sector plays crucial role in the economic pursuits of the people of the district. More than 70% of the total working populations are engaged in agricultural sector where about 60% as cultivators as and little less than 15% as agricultural labour. They have however shifted their traditional occupational systems which are based on nature like fishing, hunting, animal rearing and lumbering etc. to other occupations and also have changed their occupation, living standard, food habit and culture. With the passage of time, those living in urban areas are now engaged in various occupations in the secondary and tertiary sector and those living in the remote rural areas have also witnessed a change in their occupational patterns.

3.4.1 SIZE-WISE DISTRIBUTION OF POPULATION

There is direct impact of physical and climatic characteristics, natural resources as well as cultural aspects on the distribution of population. It has rightly been remarked that population distribution is a dynamic process which is ever changing, and cause and effect vary in time and space (Clark 1972). Further, the economic characteristics of an area also influence the population distribution pattern.

As per the census 2011, the district Karbi Anglong has 2712 inhabited and 209 uninhabited villages including 6 Statutory Towns and 1 Census Town. Diphu (TC) is recorded to be the most populous with 61797 persons, while Laharijan Natun Bosti (CT) is the smallest in population with 2508 persons (**Table 2.4).** According to population size categories given by the Census of India, 2011, total inhabited villages have been distinguished into seven categories, namely, extremely large (Above 10000 persons) , Very large (5000-9999), Larger (2000-4999), Large (1000-1999), Medium (500-999), Small (200-499), and Very small (less than 200 persons). Of these categories of population size, no extremely large size centre is found in the study area. But more than half i.e 54 percent villages have been found under the category of very small size and 30 percent under small size in the district. Accordingly, little more than 10 percent villages under medium size category, 4 percent and 1 percent villages under the categories of large size and larger size category are observed respectively **(Table 2.7).**

If the distribution of size-wise population of various CD Blocks in the district is studied, it is found rather observed that more than three-fourth of the villages in the district which includes Bokajan, Lumbajong, Nilip, Rongmongve and Langsomepi CD Blocks have the maximum share of very small size of villages. Here in these areas, more than 60 percent villages fall under this category **(Table 2.7).** Most of these areas are comparatively occupied by the cultivable land than the other areas of the district. As a result, these areas are dominated by very small size villages. There are very few villages which are occupied by small size and larger size of population in the district. Only two number of village is found to be recorded having very large size villages under Ronkhang CD Block. The share of Medium size villages is however found to be distributed almost equally except Rongmongve CD Block which shares three percent only. There are only a few settlements having large and larger size where most of the major facilities/amenities are located.

It is therefore accepted that the population size and centrality/ nodality of the settlements have a close and positive relationships. This hypothesis may be tested to study the distributional/locational patterns of functional facilities in relation to population block wise in the district. Thus, the spatial distribution of these facilities/amenities has been described in the next chapters of the present study.

Table 2.7

Size-wise Population Distribution in Karbi Anglong District, 2011

Population Size	Amri		Bokajan		Chinthong		Howraghat		Lumbajong		Nilip		Rongkhang		Rongmongv		Samelangso		Socheng		Langsomepi		District	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Extremely large (Above 10000)	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%
Very large (5000-9999)	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	2	1%	0	0%	0	0%	0	0%	0	0%	2	0.07%
Larger (2000-4999)	0	0%	11	3%	1	1%	1	0%	3	1%	0	0%	10	5%	0	0%	0	0%	0	0%	1	0%	27	0.99%
Large (1000-1999)	7	5%	24	6%	4	3%	18	5%	10	2%	0	0%	38	19%	0	0%	0	0%	5	7%	4	2%	110	4.06%
Medium (500-999)	22	17%	37	9%	21	15%	64	19%	23	6%	15	5%	63	31%	5	3%	16	5%	10	13%	12	5%	288	10.62%
Small (200-499)	46	35%	97	23%	60	43%	128	38%	97	23%	70	25%	52	26%	57	32%	110	36%	38	50%	74	31%	829	30.57%
Very small (less than200)	57	43%	250	60%	52	38%	123	37%	284	68%	195	70%	36	18%	114	65%	178	59%	23	30%	144	61%	1456	53.69%
Total	**132**	**100%**	**419**	**100%**	**138**	**100%**	**334**	**100%**	**417**	**100%**	**280**	**100%**	**201**	**100%**	**176**	**100%**	**304**	**100%**	**76**	**100%**	**235**	**100%**	**2712**	**100%**

Source : District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

Note : Total Number of Inhabitant Villages = 2712
Total Number of Uninhabited Villages = 209

N.B : 1 = Total Number of the Villages
2 = Percentages of the Total Villages

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CHAPTER – IV

LOCATIONAL PATTERNS OF FUNCTIONAL FACILITIES

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LOCATIONAL PATTERNS OF FUNCTIONAL FACILITIES

It is obvious that, the study of the settlements and their space relations constitute one of the bases of regional studies at different area levels. Likewise, the distributional patterns of socio-economic amenities/facilities and their inter-relationships with various elements of resources also explain the strong base of study of overall patterns of developments of the regions at different levels. Similarly, the locational patterns of various functional facilities and their analysis of the region plays vital role in determining the overall development of the region. The inter-relationships among various amenities/facilities or functional facilities thus depend a great deal on where they are located. The study of locational patterns of various functional facilities, i.e., Phenomena-their role and concentration in relation to space is studied here. It is widely accepted that, there is a positive relationship between population and socio-economic amenities/facilities (Waheeduddin Khan-1972)[1]. This means that the settlements which have higher population size would be performing greater intensity and availability of socio-economic facilities. In other words, higher the population size, greater would be the intensity and availability of facilities. This premise is examined here in the present study by describing the locational patterns of functional facilities in Karbi Anglong District, Assam.

To test the validity further of the above premise of the location/distributional patterns of various functional facilities and services in the study area, simple cartographic methods/techniques have been applied. Before analyzing further, all the facilities/amenities are classified according to the given scheme (**Table 3.2**) and their location/distributional patterns are shown with the help of preparing distributional Maps for 2011 **(Map 1.14 & 1.15)**. The changing natures of the distribution of the facilities are also described. The salient features of the distribution of these facilities have also been shown by preparing simple graphs and diagrams. Further, the spatial patterns of the facilities are studied in relation to population size distribution of the study area. The Spatio-functional patterns have been described in the next chapter (Chapter-V) of the present study.

However, before describing the validity of location/distributional patterns of

functional facilities in detail, a brief historical account of the development of educational facilities in the study area have been incorporated here and interpreted under the following heads:

4.1 HISTORICAL ACCOUNT OF THE DEVELOPMENT OF EDUCATIONAL FACILITIES

4.1.1 ANCIENT EDUCATION SYSTEM IN KARBI ANGLONG

The ancient form of education system in Karbi society was mainly confined to a tribal dormitory type of institution called 'Jirkedam'[2]. It was an institution based upon work experience and social service.

As there are no records and historical writings, the date or the periods of establishment of this institution Jirkedam could not be ascertained. The earliest written documents names' one Harbimang in whose time this institution was first established in the village council meeting held in Headman's house in the village Amchekso in Resak Hills.[3]

The institution called 'Jirkedam' is particularly meant for the adolescents and there is no place for the married men and women though they may come to the dormitory platform for village council meeting or evening gossip, yet they are not allowed to sleep there at night. It is based mainly upon "work experience and social Science". The Karbi social workers had their beginning here, to train up the future generation as responsible person to build up a strong and active Karbi Society. The village Headman known as "Sarthe" took initiative in the formation of the institution. He used to call upon the youths of the village and discuss the essence of the establishments of a youth club in the outskirt of the village. After the consent was received from the youth, the Sarthe formed a committee headed by an expert. The expert known as "Terang Asar" was supposed to know everything which was essential in day to day life. A girl was selected only as associate office bearer who is called 'Marpi' attached to the boy.[4]

The dormitory house was known as "Risomar A Terank"[5]. The essential qualifications to a Terank Asar were that:

1. The boy should be an expert in social customs
2. Possess simple knowledge of the various activities essentials for livelihood, and
3. Should be active and have a strong personality.

There was no reading and writing in Jirkedam only practical knowledge was taught which was very much essential in the day-to-day life. Personality development and culture transmission were the two important functions of Jirkedam. The youth develop simplicity, hospitability, cooperation, discipline and self-reliance. The married women were excluded from this institution. They were not even allowed to come to the courtyard for enjoying meals or songs and dances. Usually all the unmarried boys and girls become the members here. The rule for recruitment to office bearers is only one boy from each family and the adolescents girls are subsequently recruited as associate office bearers of the institutions.

4.1.2 BEGINNING OF FORMAL EDUCATION IN KARBI ANGLONG

The history of formal education in Karbi Anglong started after the arrival of the Christian Missionaries in the late 1850's and was introduced only as early as 1860's. The Christian Missionaries were the first to introduce education among the tribal people in Karbi Anglong District. They devoted their attention towards the spread of education besides evangelistic works for the people of Karbi Anglong. They played an important role in the field of education and development in Karbi Anglong District. At the beginning, the Christians' preaching among the Mikir was not direct. A number of Mikir who came down to the plains first came into close contact with the Christian Missionaries and got converted to Christianity around 1859. Simultaneously, some mission and evangelism works were carried out in Tika Pahar by the Council of Baptist Churches of North-East India (CBCNEI).[6]

Literacy was at scratch during early mid-90s, the case figures of 1931 disclosed that the percentage of literacy among the tribes were as low as 0.7 percent. Some of the states recorded even below 1 percent.[7]

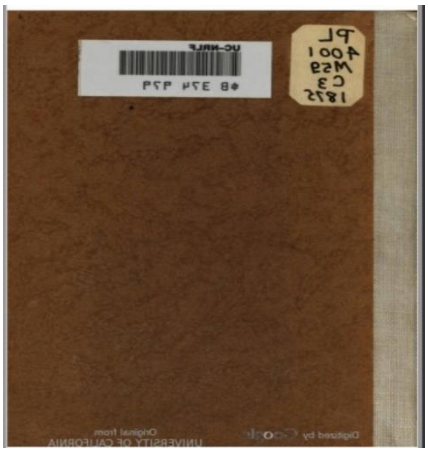
The credit for the introduction and spread of education in the district however goes to the Christian Missionaries especially for the foundation of Primary Schools way back in the late 1850s. Before the arrival of American Baptist Christian Missionaries, there was no script and education as well among the Karbi People. It was decided only in 1864 by the Governor General in Council that the tribes belonging to the state of Assam would be imparted education through Roman Script and on demand Assamese and Bengali language would be continued.[8]

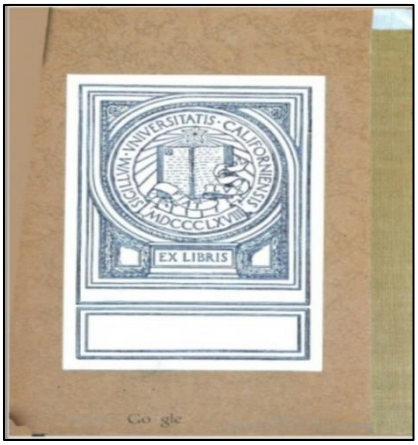
Though the Missionary works had been started in Karbi Anglong, but no good response was received. Only one school run by the Missionary at Tika Pahar received

some educational importance in the district.[9] As a result, many of the Karbi students went to the neighboring districts for acquiring their education. During1871, the present Karbi Anglong district was adjoined in Nagaon district. There were altogether 11 Govt. run schools in Nagaon district and the entire schools were located within the boundary of Karbi Anglong district.

In 1859, Cyrus F. Tolman and his wife Marry (Bronson) Tolman who first arrived at the place known in olden times as 'Krungjing' and now known as 'Kalonga' were the first Missionaries sent to work among the Karbi people.[10] In 1891, Rev. R.E. Neighbour arrived in the district who not only established several schools but also did some translation works. In the mean time, by publishing books, writing dictionaries, he started developing the Karbi Language.[11]

The first ever writing of the Karbi can be dated back to the middle parts of the 18th Century.[12]





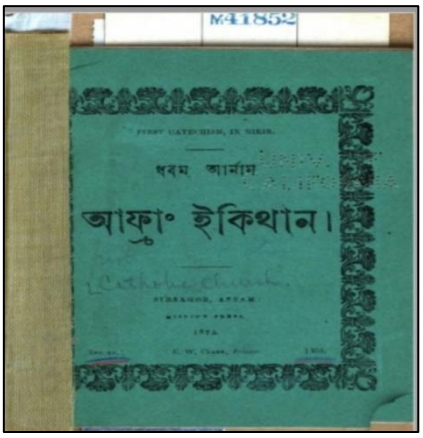


Photo 1.15 The First Catechism of Mikir

Source: Internet The first ever writing of the Karbi consisting of 13 pages, all about the Bible consisting of questions and answers in Assamese characters by Rev. P. Edward Moore.[13]

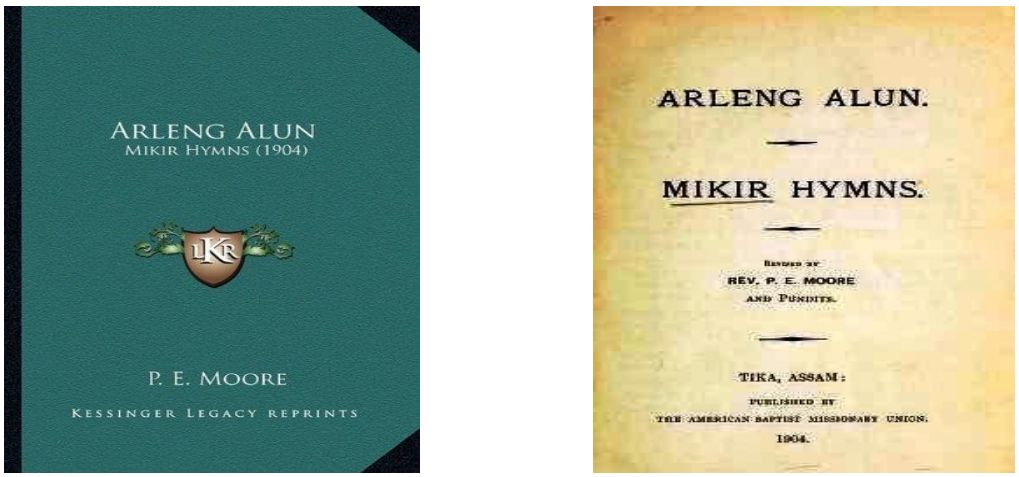


Photo 1.16 The First Mikir Hymns

Source: Internet

Another school at Tika Pahar was established by J.M. Karwel and P.E. Moore appointed Thenkur Singh Engti as its first Headmaster. In the same area, some Night schools were also set up in Tika Pahar area. However, the educational works in Karbi Anglong district were restricted to the areas of adjoining districts of Assam. No doubt, some schools were established and concentrated at Tika Pahar area but was in unsatisfactory condition and hence, the educational condition in the district under the British rule was practically neglected. The British established some Mouzas (a division of district) only under Mouzadar (a fiscal officer for managing the works of mouza) for collecting revenue.[14]

It was Semson Sing Ingti who following the footsteps of the Christian Missionaries started to set up Primary Schools around late 30^{s} and early 40^{s} in different villages in the district. But at first, people of the area did not give much importance to education, instead, they thought education is meant only for the Christians as they were nature believer and animists and so majority of people gave cold response. Initially, Assamese education was taught where Karbi People found it difficult to learn. However, slowly, Sri Semson Sing Ingti conceived an idea of teaching Assamese language among the people living in the region. Accordingly, the mass leader along with a few persons like Basapi Ingti Katharpi published books like "Kalakha Akitap" meaning Tables, "Temoperu" and "Bitusi" etc.[15]

The Mikirs, because of their extreme poor economic conditions and social backwardness remained indifferent towards education. Moreover, there were a very few numbers of local elementary schools which were very inadequate to the requirement of the people living in the area. Only some Karbi who lived near the area of large population had the opportunity for attending the schools. On the contrary, those lived far away from each other and led a scattered life away from schools close by and as such even primary education was beyond their reach, which was a serious handicap to the spread of education among the Karbi in Pre-Independence period.

4.1.3 PROGRESS OF EDUCATION IN KARBI ANGLONG AFTER INDEPENDENCE

Although initially there was a serious handicap to the spread of education among the people in the region during pre-independence period, there has been certain changes in the entire educational scenario of Karbi Anglong during Post Independence era. Since, education was a least important subject in Karbi Anglong; the literacy rate was very low. Office of the Deputy Inspector of Schools was started in 1954 at Diphu, the Head Quarter of the district[16]. This became an important milestone in the development of Primary Education in Karbi Anglong. The district Council of Karbi Anglong has been indicative for the upliftment of their education ever since 1954, and its ideas indicating primary education institution began to grow since then.

The change in the post-independence educational scenario of the district can clearly be seen from the **Table: 3.1.** It is observed that, during the last 60 years of time there has been considerable increase in the literacy rate in the District of Karbi Anglong. In 1951, the literacy rate was as low as 05.9 percent, 16.92 percent in 1961, and in 1971 it increased to 19.17 percent. In the subsequent year, in 1991 the literacy rate increased up to 45.57 percent, 58.83 percent in 2001 and 69.25 percent as per 2011 census in the district against73.18 percent in Assam and 74.04 percent in India. This decadal literacy growth rate in the district has also shown more literate male population than female population. At present, comparatively, the literacy rate in rural areas is much lower than urban areas. As a consequent of this fact, the vast differences between male and female literacy rate calls for urgent steps to be taken and implemented by the concerned authorities for encouraging female education in the district. The present study has however witnessed a little progress and shown that quantitatively the region is

progressing in the field of education. The following Table (**Table 3.1)** and Figure (**Fig: 1.4**) further justifies the picture of progress in the field of education in the district.

Table 3.1

Decadal Literacy Growth in Karbi Anglong (1951-2011)

Year	Male Literacy rate (in percentage)	Female Literacy (in percentage)	Total Literacy Rate (in percentage)
1951	09.26	02.17	05.9
1961	25.56	06.87	16.92
1971	26.93	10.29	19.17
1981*	-	-	-
1991	55.55	34.35	45.57
2001	68.11	48.65	58.83
2011	82.12	64.62	69.25

Source: Office of the Joint Director of Economics and Statistics (Hills), Diphu
* indicates no census was held in 1981 in Assam

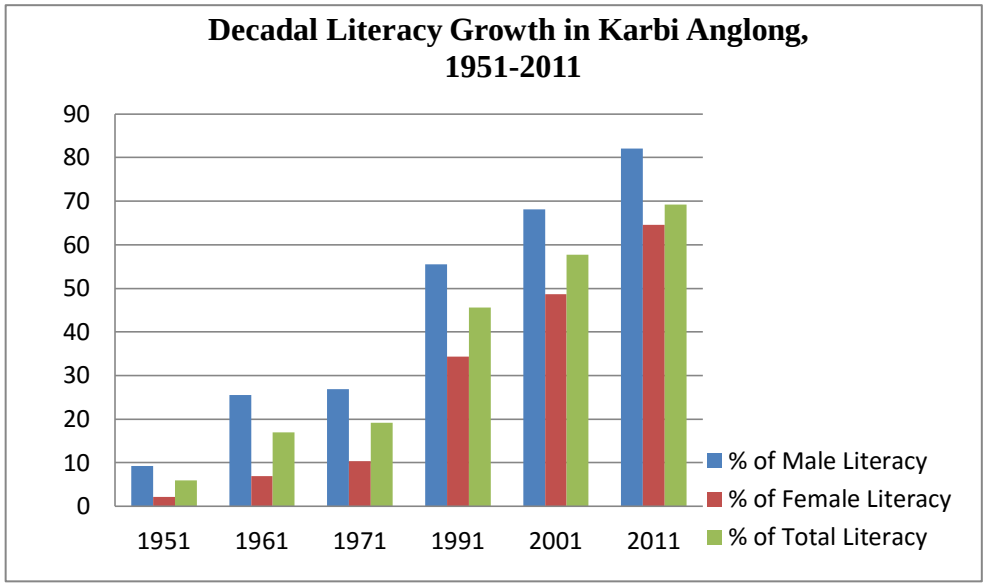


Fig: 1.4

After discussing a brief historical account of the development of educational facilities, beginning of formal education and its progress in the post-independence period in the district, following simple criteria have been taken into account for describing the location/distribution of functional facilities available in the region.

4.2 DISTRIBUTION OF FACILITIES

For submitting a more generalized but logical description and interpretation of spatial distribution of these facilities and services, it is a pre-requisite to classify them into major categories. In the district under study, there are as many as seven major socio-economic amenities or facilities out of which only two major facilities–Education and Health facilities have been taken into account. Other facilities, other than transport and communication system, like, water supply, market, power supply and administration and facilities related to agricultural resources of the area have not been considered here in the present study because of cumbersome practice of collection of data. The major amenities/facilities taken into account in the present study are further sub-categorized for detailed study as given in the Table. **(Table 3.2)**

Table 3.2

A Scheme of Classification of Facilities

Sl Nos.	Major Categories	Sub-Categories
1	Education	a) Primary Schools b) Middle Schools c) High Schools/Secondary Schools d) Higher Secondary Schools e) Colleges
2	Health (Medical)	a) Community Health Centres (CHC) b) Primary Health Centres (PHC) c) Primary Health Sub Centres (PHSC) d) Maternity & Child Welfare Centres (MCWC) e) State Dispensary (SD) f) Family Welfare Centre (FWC) g) Others

4.3 THE EDUCATIONAL FACILITIES/ FUNCTIONS

Education is the backbone for the uplifment and development of the society of any area or region. It plays a significant and crucial role both in terms of quantity as well as quality of socio-economic development in the country. Education as an important human activity plays a very vital role in human life. It is indispensible for the development of human resource. Education is the sword through which one can fight

against the evil effects of illiteracy. It is one of the most important factors of development. It is the most important single factor in achieving rapid development and in creating a social order based on the values of freedom, social justice and equal opportunities (Patrik, 1967)[17]. Education is a window through which one can see the whole world as well as unavoidable aspects of human life. It is an important parameter for any inclusive growth in an economy. Therefore, education is an important avenue for upgrading the economic and social conditions of the society.

In the case of the Karbi Anglong district, formal education was introduced by the Christian Missionaries only as early as 1860's. The National Policy on Education (1986), Government of India, has ushered a new chapter and raised new hopes and aspiration in the minds of Indian students, teachers, administrators, planners and national leaders. The most important contribution of educational policy is to provide a purposeful base and to strengthen the roots of socio-economic development. With a view to bring about lasting improvement of a society, it is felt imperative to develop human resources at first. Thus, education is regarded as a most potential instrument of national development. Education mainly deals with the improvement of human resources. It is through education that a nation transmits its heritage, recreates its culture, strengthens its economy and converses its values. It means to promote 'individual excellence' (Saxena, 1976)[18]

It is widely accepted that economic levels are much more align to expansion of educational facilities. There are many studies which indicate that socio- economic development of an area or country is directly and positively related to educational levels (Mohanty, 1988, Mangal, 1990)[19]. Such relationships may also be visualized in its spatial context.

The spatial patterns of educational facilities are inter-related and inter-dependent with the pattern of socio-economic development of an area. Of course, socio-economic development of the area influences the intensity and pattern of educational facilities and inversely, educational facilities also have implicit impact on socio-economic development. As a result, location-specific plan for educational facilities may provide spatial optimal structure of socio-economic development. Educational facilities generate awareness and skills among the inhabitants of the area. The infrastructure of education is a very important indicator to determine the level of development of any region. It can be easily said that the region with more educated inhabitants is probably well developed. However, in village/ rural areas the infrastructure of education is less as compared to that

of urban/town areas. In fact, lower orders of educational institutions are noticed in rural areas. The common institutions in these areas are, Primary Schools, Middle Schools, and at the most Secondary Schools, whereas Degree Colleges (Govt. & private owned), Professional Colleges and University are mostly located in urban areas. In fact, the higher educational institutions in the district are urban centric.

The distribution as well as location of educational facilities therefore has assumed significant dimension in accelerating the processes of socio- economic development. In the slow developing backward rural economy of hill tribes, the education is much more significant element than any other element of development. Education is the backbone for the upliftment and development of the society of any area or region. The future of a society can be determined by the present status of educational institution.

The educational institutions in the region were established in different parts of the blocks/areas, keeping in mind to facilitate and absorb the local students for their bright future educational life. But, most of these institutions are seen to be concentrated near and around the areas where there are basic amenities/facilities, transport and communication connectivity and day to day needs are easily available. The Physiographic location and socio-economic conditions like hilly and mountainous topography and especially primitive economy are not favorable in development of educational facilities in the region. However, Diphu the Head Quarters and one of the fastest growing towns in Karbi Anglong district in terms of urbanization has direct attraction of people. The growth of the town itself concentrates educational as well as other facilities of the district because of its demand factor**.**

At present, right from primary education to higher education, all kinds of educational facilities are found in the district of Karbi Anglong. As per 2011 census, there were altogether 465 Pre Primary Schools, 1812 Primary Schools, 410 Upper Primary/Middle Schools, 97 Secondary/High Schools, 13 Higher Secondary Schools, 03 Degree Colleges and 14 numbers as other institutions in the entire District. However, these educational institutions have been seen increasing considerably except in Upper primary/middle schools in the district. According to 2016, it is observed that, there are 1977 Primary Schools, 356 Upper Primary/Middle schools, 118 Secondary Schools/High Schools, 28 Higher Secondary Schools, 05 KGBV and 20 Degree Colleges of various streams such as Arts, Commerce and Science streams including other higher educational

institutions (govt. and private) found in the urban as well as rural areas in the district (**Table 3.3(a) & 3.4)**. But these block wise numbers of schools and Degree Colleges seems to be insufficient and cannot fulfill the change in demand of the people of the entire region. The state government as well as the district council authority have been engaged in expanding education in the district and have come up comparatively; still it is lagging far behind in comparison to other neighbouring districts.

In the district it is observed that, there is only one University Campus (Assam University, Diphu Campus established in 2007) under which all the Degree colleges and other institutions like Law College, B. Ed College and Polytechnic are affiliated to. In the region, these primary and secondary schools give facilities to the student communities of the district as a whole and peripheral regions, especially to the students those coming from the remote rural areas. Moreover, the degree colleges and university (Assam University, Diphu Campus) provide the higher education facilities to the students in the surrounding regions. Even the students coming from different nearby areas of the districts and states take their education from these institutions**.**

Table: 3.3

Block-wise Number of Educational Institutions in Karbi Anglong District, 2011

Sl No	Name of CD Blocks	Category of Schools														
		Govt. Pre - Primary School (Nursery/LKG/UKG) (Numbers)	Private Pre - Primary School (Nursery/LKG/UKG) (Numbers)	Govt. Primary School (Numbers)	Private Primary School (Numbers)	Govt. Middle School (Numbers)	Private Middle School (Numbers)	Govt. Secondary School (Numbers)	Private Secondary School (Numbers)	Govt. Senior Secondary School (Numbers)	Private Senior Secondary School (Numbers)	Govt. Arts and Science Degree College (Numbers)	Private Arts & Science Degree College (Numbers)	Others (Govt.)	Others (Private)	Grand Total
1	Amri	11	18	104	8	27	2	11	2	1	1	0	0	0	0	**185**
2	Bokajan	31	21	181	8	36	1	7	0	1	0	0	0	0	0	**286**
3	Chinthong	9	4	122	2	21	0	5	0	0	0	0	0	0	0	**163**
4	Howraghat	85	20	253	24	68	2	12	3	0	0	1	0	0	1	**469**
5	Lumbajong	29	13	156	11	37	6	6	7	0	2	0	0	2	1	**270**
6	Nilip	18	3	163	8	19	0	4	1	0	0	0	0	0	0	**216**
7	Rongkhang	14	28	221	33	130	14	22	7	6	0	1	0	3	4	**483**
8	Rongmongve	15	5	100	0	5	0	1	0	0	0	0	0	0	0	**126**
9	Samelangso	36	23	162	29	24	0	5	2	1	1	1	0	3	0	**287**
10	Socheng	3	15	56	11	10	0	1	0	0	0	0	0	0	0	**96**
11	Lansomepi	35	29	156	4	8	0	1	0	0	0	0	0	0	0	**233**
	Total	**286**	**179**	**1674**	**138**	**385**	**25**	**75**	**22**	**9**	**4**	**3**	**0**	**8**	**6**	**2814**

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A,Census of India-2011, Assam

Table: 3.3 (a)
Block wise Number of Educational Institutions in Karbi Anglong District, 2011

Sl. No	Name of C D Blocks	Primary Schools	Middle Schools	High Schools	Higher Secondary	Degree Colleges	Others
1	Amri	112	29	13	02	0	0
2	Bokajan	189	37	07	01	0	0
3	Chinthong	124	21	05	0	0	0
4	Howraghat	277	70	15	0	01	01
5	Lumbajong	167	43	13	02	0	03
6	Nilip	171	19	05	0	0	0
7	Rongkhang	254	144	29	06	01	07
8	Rongmongve	100	05	01	0	0	0
9	Samelangso	191	24	07	02	01	03
10	Socheng	67	10	01	0	0	0
11	Langchomepi	160	08	01	0	0	0
	Total	**1812**	**410**	**97**	**13**	**03**	**14**

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

Table 3.4

Block wise Number of Educational Institutions in Karbi Anglong District, 2016

Sl. No	Name of C D Blocks	Primary Schools	Middle Schools	High Schools	Higher Secondary	Degree Colleges & Other Educational Institutions
1	Amri	140	14	4	1	0
2	Bokajan	227	45	18	5	3
3	Chinthong	181	28	10	2	0
4	Howraghat	215	54	17	5	1
5	Lumbajong	239	40	16	6	9
6	Nilip	154	20	7	2	1
7	Rongkhang	251	51	15	4	4
8	Rongmongve	126	16	8	0	0
9	Samelangso	162	18	7	1	1
10	Socheng	147	48	10	1	0
11	Langchomepi	135	22	6	1	1
	Total	**1977**	**356**	**118**	**28**	**20 ***

Source: Office of the District Mission Co-Ordinator Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu
* Author's Personal computation based on Field Survey information

4.3.1 PRIMARY SCHOOLS FACILITIES IN KARBI ANGLONG

The introduction and spread of education in the district especially for the foundation of Primary schools may be date way back to late $1850_{S.}$ Initially during that time, only one school run by the Christian Missionary at Tika Pahar received some educational importance in the entire district. There was no script and education as well among the people in the region. There was a dearth of education facilities in the region in those times. In 1899, the Missionaries established another school, a Primary school and started the M.E section on 1st April, 1934 and the Govt. recognition of both the section was granted in 1935 and 1938 respectively. **[20]**

It is recorded that, there were 180 Primary schools in 1953 which was increased to 1812 in 2011 in the district (**Table 3.6**). Presently, there are 1977 primary schools in the district as per the year 2016. Out of these 1977 Primary Schools, 1870 schools are run by the Govt. institution whereas 107 schools are run by private institution. It is however, observed that the progress rate of primary schools per year in the last 55 years (1953-2008) was 23 schools only, whereas, during the year 2008 to 2016, it was recorded 33 schools.

The history of formal education in the district is more or less parallel to the formation of the separate district of Karbi Anglong as people saw only a few Primary Schools in the beginning during its initiatives. In the later years some initiatives were taken by the authority of Karbi Anglong district in the field of inherent subject of the district council as provided in the 6th Schedule of the Indian Constitution.**[21]** Prior to the creation of separate district, the schools of Karbi Anglong were managed and controlled by the respective School Boards of Nagaon and Golaghat. After the creation of separate Hill District (United Mikir and North Cachar Hills), around 174 Schools including 6 Basic Schools were taken up from the Boards for their management.

Table 3.5

Number of Primary Schools of different categories in Karbi Anglong District during 1960

Sl. No	Type of Schools	No of Schools
1	Govt. L.P School	184
2	Govt. Aided L.P School	01
3	Basic School	39
4	Aided Basic School	06
5	'C' class School	05
6	Project L.P School	15

Source: Office of the Joint Director of Economics and Statistical (Hills), Diphu, Karbi Anglong

Prior to 1951 there was no separate district for the Karbi. There were only a few schools in Karbi Anglong till 1950. But following the creation of separate Karbi Anglong District Council in 1952, a great rather remarkable headway was made virtually in respect to education and some initiatives were taken to take the lead in the field of education (by the District Council Authority) and established 97 Primary schools with 127 teachers during the period of 1953 to 1960 with its own resources and were managed by their own Inspectorate. Since then the District Council Authority took schemes to open all primary schools as Basic schools in every area. In 1960-61, District Council constituted a District Primary Education Board for looking after the works of primary education in the district. During 1961, there were 214 Govt. lower primary schools and 98 primary schools run by the District Council in the district. Since**,** 1975 the number of Primary schools increased slowly.[22] At present the total number of Primary Schools in the district as per 2011 is 1812. The following Table (**Table 3.6**) and Figure (**Fig: 1.5**) explains the progress of Primary Schools in the district.

Table 3.6

Decade wise progress of Primary School in Karbi Anglong District, 1953-2011

Sl. No	Year	No. of Schools
1	1953	180
2	1961	360
3	1971	612
4	1975	740
5	1981	951
6	1990	1151
7	2001	1392
8	2008	1402
9	2011	1812

Source: Office of the Joint Director of Economics and Statistical (Hills), Diphu, Karbi Anglong

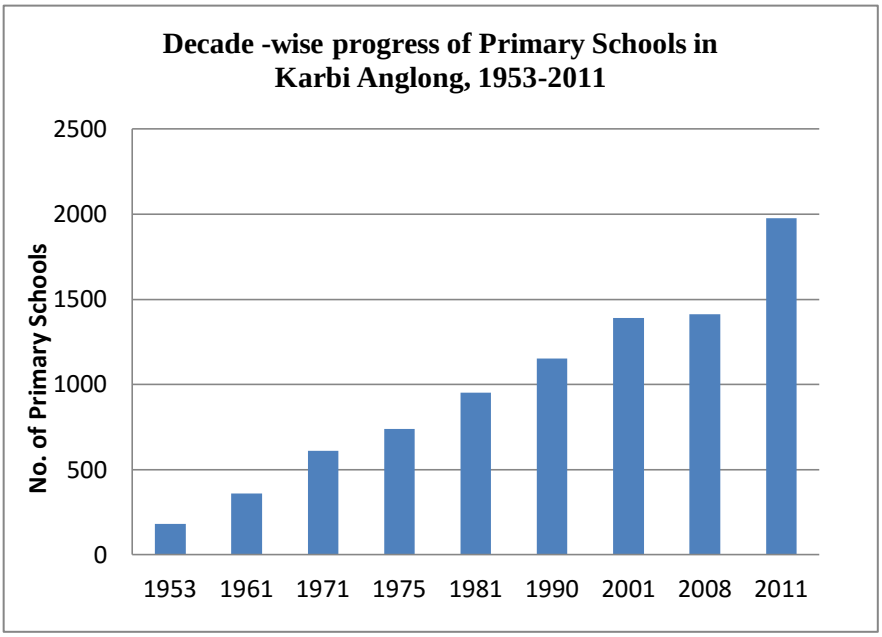


Fig: 1.5

Table 3.7

Block-wise number of Primary Schools in Karbi Anglong During 2008 & 2011

Sl. No.	Name of C D Blocks	No. of Schools (2008)	No. of Schools (2011)*
1	Amri	89	112
2	Bokajan	162	189
3	Chinthong	144	124
4	Howraghat	173	277
5	Langsomepi	106	160
6	Lumbajong	149	167
7	Nilip	90	171
8	Rongkhang	195	254
9	Rongmongve	82	100
10	Samelangso	121	191
11	Socheng	90	67
Total		**1402**	**1812**

**Source: ***DISE, District census, and Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu

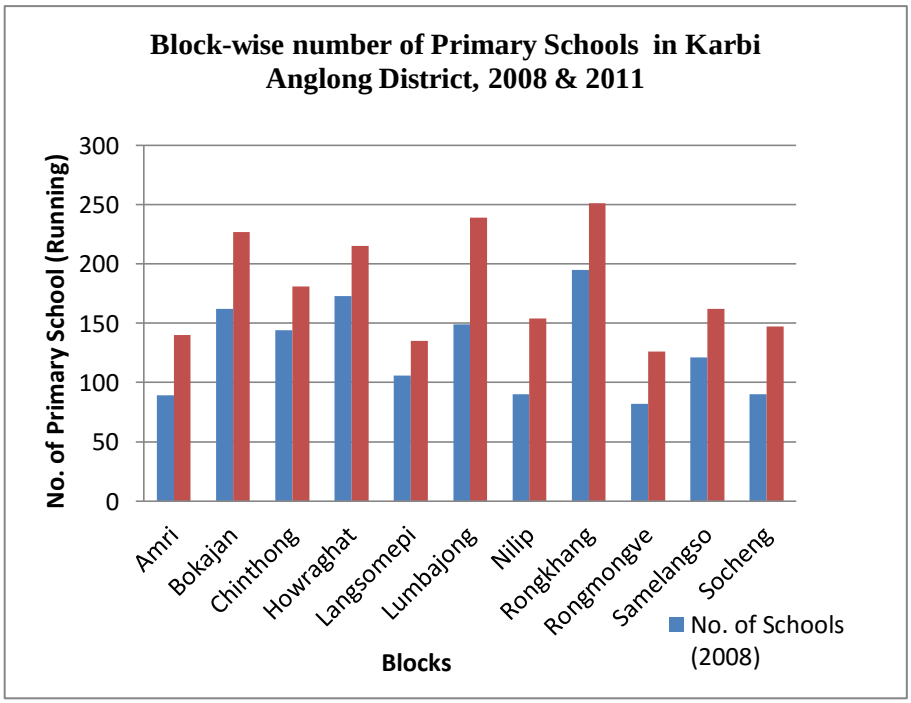


Fig: 1.6

In the year of 2008 there were 1402 Primary Schools in the region/ district, out of which as high as 195 (13.92%) schools were located in Rongkhang CD

Block. Amongst the CD Blocks, Rongmongve Block recorded the least number of 82 (5.85%) primary schools in the district. The Number of primary schools however increased to 1812 in 2011 of which 1674 (92.38%) schools were run by govt. institutions and 138 (7.62%) Schools were run by private institutions. Out of the total 11 number of CD Blocks, Howraghat CD Block recorded the highest number of 277 (15.29%) schools while, Socheng Block recorded the least number of school of 67 (3.70%) only **(Table 3.7)**. In the year of 2016, the highest number of increase of 251(13%) Primary schools were however observed in Rongkhang CD Block which was quite low compared to the highest number recorded in 2011. Meanwhile, Rongmongve CD Block has witnessed the least number of 126 (6%) primary schools. The breakup of urban and rural wise distribution of schools also reveals that, there is more number of primary schools in the rural areas than urban areas in the district. Out of the total number of 1977 primary schools, 1870 (94.59%) are located in rural areas against 107 (5.41%) numbers in urban areas. The highest number of schools in urban areas are observed in Lumbajong CD Block (40%) while, in rural areas the highest number of 239 (13%) schools are found in Rongkhang CD Block **(Table 3.11 & 3.10) & (Fig. 1.9 & 1.8).**

From the **Table 3.8** as well as **figure 1.7**, it is clearly observed that, the Primary schools in the region are mostly located scattered in the rural areas than the urban areas and are of rural in nature. Out of the total 2921 inhabited villages, only 1745 inhabited villages have Primary schools facilities covering all the 1812 Primary schools (2011), whereas 1176 inhabited villages are deprived of such facilities. The distribution of these primary schools in the district has further been studied by calculating their densities as well as locational intensities in the following pages of the present chapter.

Table 3.8
Block wise Number of Primary Schools in Karbi Anglong District, 2011 & 2016

Sl. No	Name of CD Blocks	Total No of Schools		Urban area	Rural area
		2011*	2016**	2016	2016
1	Amri	112	140	0	140
2	Bokajan	189	227	13	214
3	Chinthong	124	181	20	161
4	Howraghat	277	215	03	212
5	Lumbajong	167	239	43	196
6	Nilip	171	154	01	153
7	Rongkhang	254	251	12	239
8	Rongmongve	100	126	0	126
9	Samelangso	191	162	05	157
10	Socheng	67	147	0	147
11	Langchomepi	160	135	10	125
	Total	**1812**	**1977**	**107**	**1870**

Source: * District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

** Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu

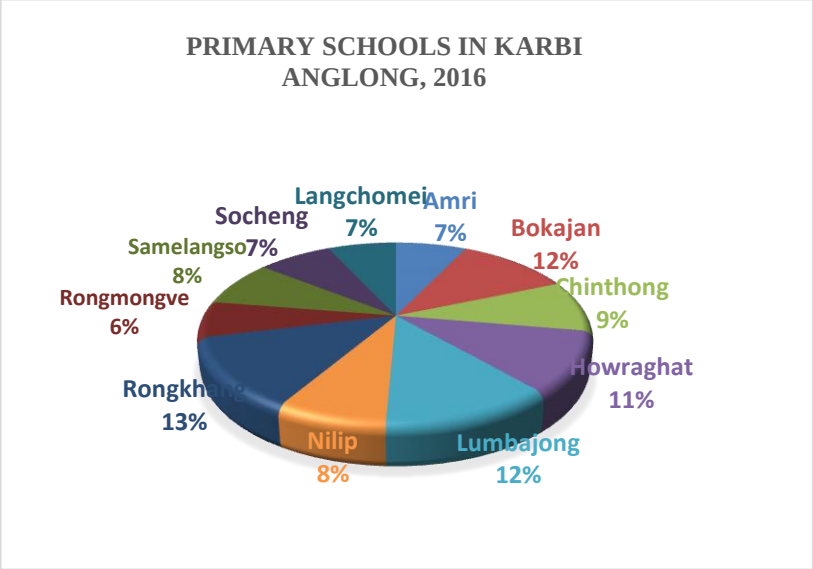


Fig: 1.7

Table 3.9

Rural Area-wise Number of Primary Schools in Karbi Anglong District, 2016

Sl. No.	RURAL	
	Name of CD Blocks	Rural Area
1	Amri	140
2	Bokajan	214
3	Chinthong	161
4	Howraghat	212
5	Lumbajong	196
6	Nilip	153
7	Rongkhang	239
8	Rongmongve	126
9	Samelangso	157
10	Socheng	147
11	Langchomepi	125
	Total	**1870**

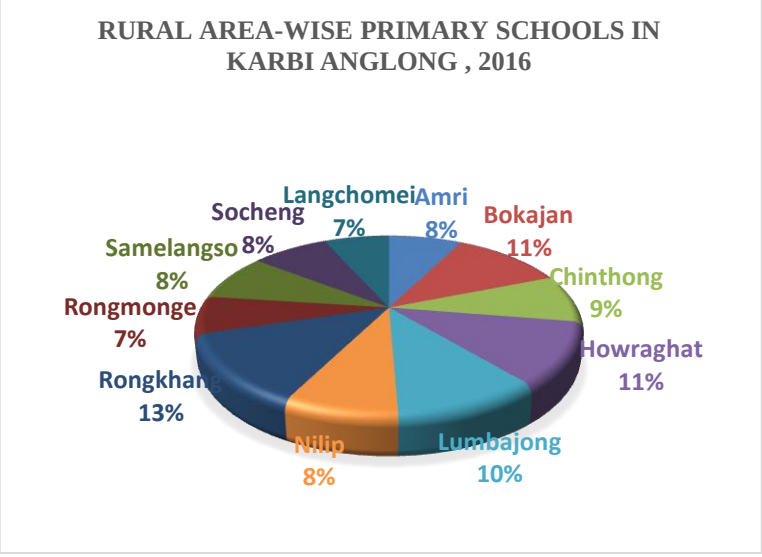


Fig: 1.8

Table 3.10

Urban Area-wise Number of Primary Schools in Karbi Anglong District, 2016

	URBAN	
Sl. No.	Name of CD Blocks	Urban Area
1	Amri	0
2	Bokajan	13
3	Chinthong	20
4	Howraghat	03
5	Lumbajong	43
6	Nilip	01
7	Rongkhang	12
8	Rongmongve	0
9	Samelangso	05
10	Socheng	0
11	Langchomepi	10
	Total	**107**

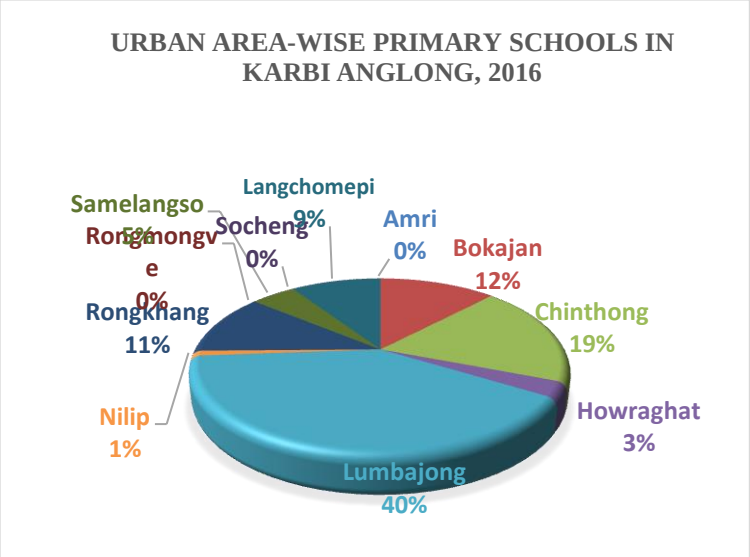


Fig: 1.9

4.3.2 MIDDLE SCHOOLS IN KARBI ANGLONG

There was a time when only a total of 14 numbers of Govt. Middle Schools were recognized during the year 1953 in the district of Karbi Anglong. The golden history of Middle Schools in Karbi Anglong had been started with the establishment of Tika Government Middle School in 1935 at Tika Pahar area which had been the great contribution of the Christian Missionaries. Since, education had not been received utmost importance in the district before independence; so the numbers of middle schools were also not considerable.

Prior to independence, there were only 05 M.E Schools and 09 Middle Schools in the entire district before the formation of Karbi Anglong District Council in 1952.The number increased up to 321 during 2002-03.[23] A great change and development could be seen after the formation of the district Council. The entire role in the field of education at present in the district is being played by the District Council Authority headed by the Secretary, under the Department of Elementary Education. Following the formation of the District Council, slowly and gradually the numbers of Middle Schools begin to increase in the district.

The gradual increase in the total number of middle schools in the district was continuously seen since 1953 up to 2006. From the Table given below **(Table 3.11),** a great change and development could be observed in the scenario of establishment of middle schools education during 1953-2006. During the period, the highest numbers of 323 middle schools were established in 2006, out of which 14 was govt. 191 Provincialized and 118 recognized. However, in the year of 2011, there was a little increase in the number which was increased to 410. Out of this, 385 were run by the Govt. institutions and 25 were run by private institutions. Rongkhang CD Block recorded the highest number with 144 middle schools during 2011. But in the later periods during 2016, there has been a marginal decrease rate in the total number of middle schools from 410 to 356 during **(Table 3.13)**. Howraghat CD Block recorded the highest number 54 (15%) **Fig1.11.** Of these total 356 middle schools, 29 are located in urban areas, while 327 are in the rural areas.

Among the highest number of middle schools located in urban area observed in Lumbajong Block 12(41%) **Fig1.13.** The distribution in the rural areas was however

observed highest in Howraghat CD Block i.e. 52 (16%) **Fig1.12**. It is also observed that out of the total 2712 inhabited villages; only 304 inhabited villages have middle schools facilities covering all the 410 middle schools (2011), whereas 2617 inhabited villages are deprived of these facilities.

From the preceding analysis, it is observed that, there is an abrupt decrease rate in the number of middle schools in the district. There are problems and difficulties in the field of elementary education which may be creating obstacles in the expansion of middle schools in the district. Another reason related to the marginal decrease in the number of middle schools may be cited as owing to the up gradation or amalgamation of the schools to the next higher category of schools in the district. As a consequence of these, many middle schools are seen to be running together with Secondary schools or High Schools in the same institutional building. It is therefore necessary that the local government authority take necessary steps in solving the problems of expansion of middle schools by providing minimum resources that are required for the proper functioning of the middle schools in the district.

Table 3.11

The Number of Middle Schools in Karbi Anglong District up to 2006

Year	No. of Schools	Government	Provincialised	Recognized
1953	14	14	-	-
1963	25	14	11	-
1973	47	14	32	01
1983	92	14	75	03
1993	272	14	190	68
2003	321	14	191	116
2006	323	14	191	118

Source: DISE Information, Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu

Table 3.12

Block-wise number of Middle Schools established in Karbi Anglong District, (1953-2009)

Name of Blocks	Total Schools	Provincialised	Recognized
Amri	14	10	04
Bokajan	44	23	21
Chinthong	26	19	07
Howraghat	47	23	24
Lumbajong	32	23	09
Nilip	20	15	05
Rongkhang	47	29	18
Rongmongve	14	08	06
Samelangso	17	13	04
Socheng	42	29	13
Langchomepi	20	13	07
Total	**323**	**205**	**118**

Source: DISE Information, Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu

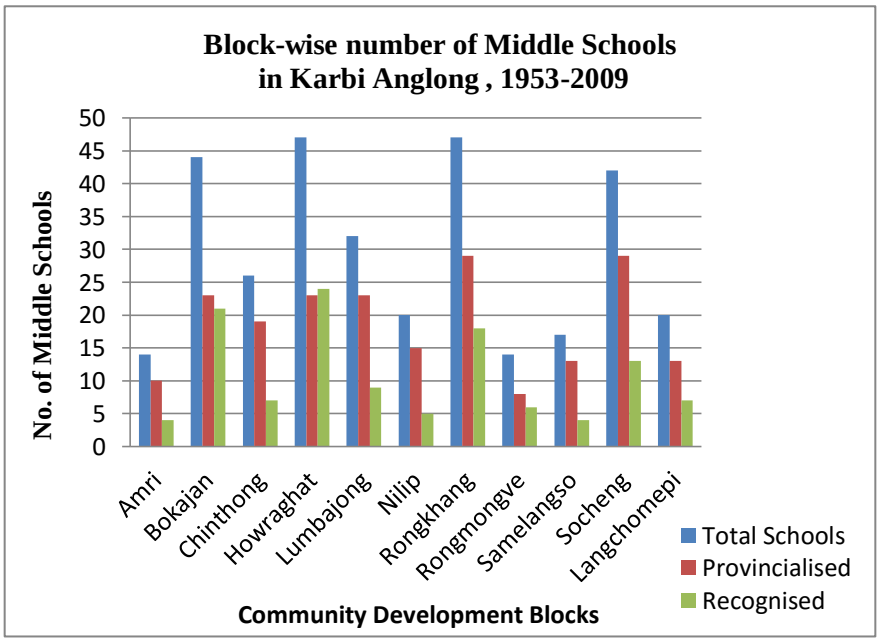


Fig: 1.10

Table 3.13

Block wise Number of Upper Primary (Middle) Schools in Karbi Anglong District, 2011 & 2016

Sl. No	Name of CD Blocks	Total No of Schools		Urban area	Rural area
		2011*	2016*	2016	2016
1	Amri	29	14	0	14
2	Bokajan	37	45	8	37
3	Chinthong	21	28	3	25
4	Howraghat	70	54	2	52
5	Lumbajong	43	40	12	28
6	Nilip	19	20	0	20
7	Rongkhang	144	51	2	49
8	Rongmongve	05	16	0	16
9	Samelangso	24	18	1	17
10	Socheng	10	48	0	48
11	Langchomepi	08	22	1	21
	Total	**410**	**356**	**29**	**327**

Source: * District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

** Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu

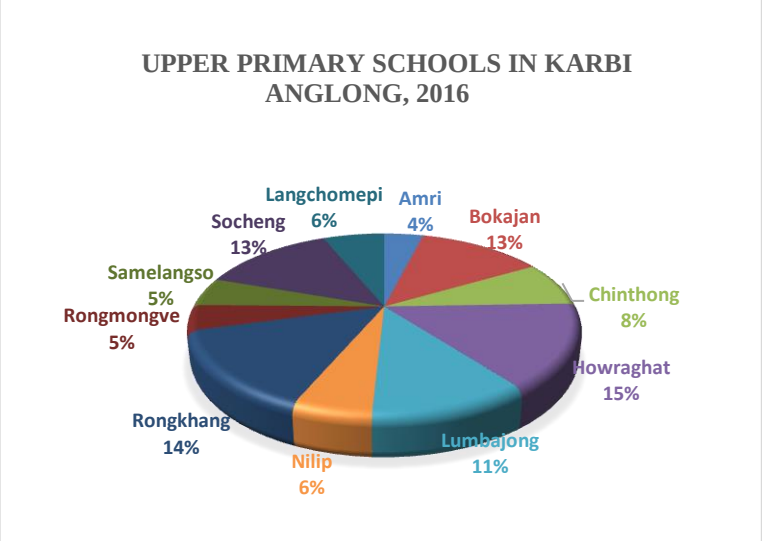


Fig: 1.11

Table 3.14

Rural Area-wise Number of Upper Primary Schools in Karbi Anglong District, 2016

	RURAL	
Sl. No.	Name of CD Blocks	Rural Area
1	Amri	14
2	Bokajan	37
3	Chinthong	25
4	Howraghat	52
5	Lumbajong	28
6	Nilip	20
7	Rongkhang	49
8	Rongmongve	16
9	Samelangso	17
10	Socheng	48
11	Langchomepi	21
	Total	**327**

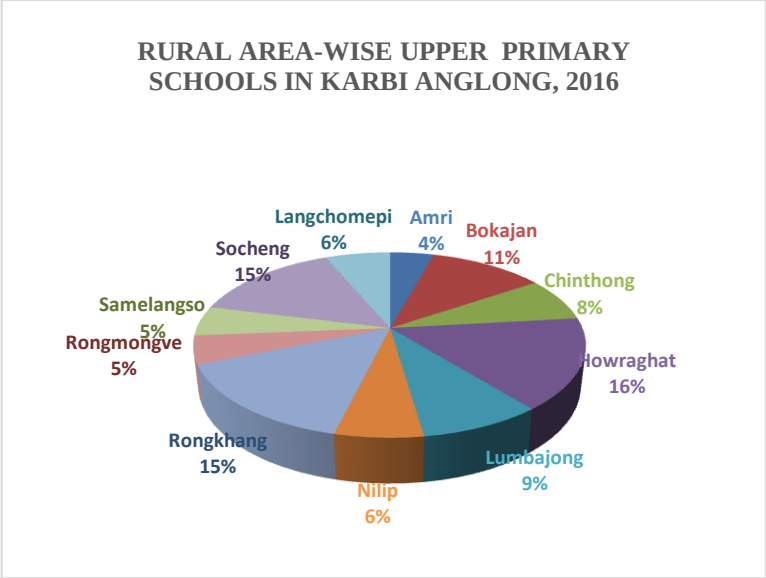


Fig: 1.12

Table 3.15

Urban Area wise Number of Upper Primary Schools in Karbi Anglong District, 2016

	URBAN	
Sl. No.	Name of CD Blocks	Urban Area
1	Amri	0
2	Bokajan	8
3	Chinthong	3
4	Howraghat	2
5	Lumbajong	12
6	Nilip	0
7	Rongkhang	2
8	Rongmongve	0
9	Samelangso	1
10	Socheng	0
11	Langchomepi	1
	Total	**29**

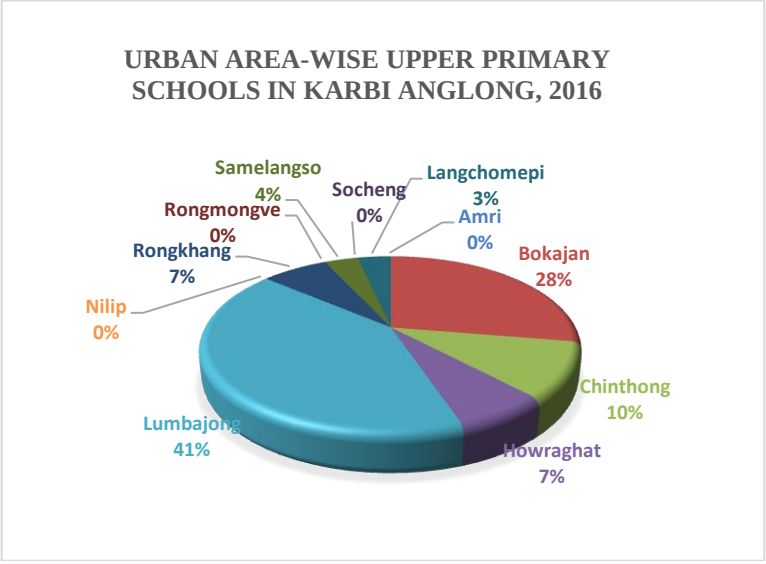


Fig: 1.13

4.3.3 HIGH SCHOOLS/ SECONDARY SCHOOLS EDUCATION IN KARBI ANGLONG

Generally, a Secondary School or High School is an organization that provides upper section of the secondary education imparting education at IX and X. It comes after primary education and is a gift of modern education. Secondary education was introduced by the Christian Missionaries and Indian reformers in the later part of 18th and the beginning of 19th century. It was only in the year of 1995 that the charge of Secondary education was taken over by the Karbi Anglong Autonomous Council, after signing of MoU. Since then all the Secondary educational activities had been done through the Council.

Prior to the Independence, Secondary education was at 0 (zero) level. There were only 9 middle schools providing Secondary School in the district up to 1953 which increased rapidly after the formation of the District Council [24]. A total of 203 Registered High Schools were observed under the control of Inspector of School Office under Karbi Anglong Autonomous Council, of which 01 High School was run by Govt., 77 Provincialized and 140 Recognized.[25]

But as per 2011census, only a total of 97 High Schools were observed out of which 75 were run by the govt. institution and 22 were run by private institution. During the period, the maximum number of 29 High Schools was observed in Rongkhang block while the least number was observed 1 each in Rongmongve, Socheng and Langchopepi CD Blocks respectively **(Table 3.17).**

There was however, a little increase in the number of Secondary schools in the district in 2016. From the Table **(Table 3.17**) and Figure **(Fig. 1:15)**, it is seen that out of the total of 118 Secondary schools, Bokajan CD Block recorded the highest number of 18 (15%) schools and the least in Amri Block (3%). Of these total number of Secondary schools, 14 (11.86%) are found to be located in urban areas and 104 (88.14%) in rural areas. Most of these schools located in urban areas are found in Lumbajong CD Block (50%) whereas schools in the rural areas are found in Howraghat CD Block (15%). It is also observed from the study that, out of the total 2921 inhabited villages including 209 uninhabited villages, only 92 inhabited villages have been covered by Secondary schools facilities where as 2829 inhabited villages are deprived of the facilities thereby making the people of the areas far behind from getting such facilities. During the post-

independence period though the number of Secondary schools has been increased considerably, compared to their needs in the district the present number of the schools in the district is not adequate. Further, it is also observed that, the present number of the Secondary schools facilities in the entire district compared to its present population and the geographical area it is not at all sufficient for which the rate of literacy is still low. Therefore, the need of the hour is to expand the number of Secondary school education facilities in its fullest capacity by the local authority by adopting qualitative measures for the greater interest of the people of the district especially for the woman society.

Table 3.16

Number of High Schools in Karbi Anglong District, (1957 to 2008)

Years	Number of High Schools
1957	01
1961	08
1971	29
1983	56
1985	65
1987	82
1989	86
2008	137

Source: Office of the Inspector of Schools, Diphu, Karbi Anglong

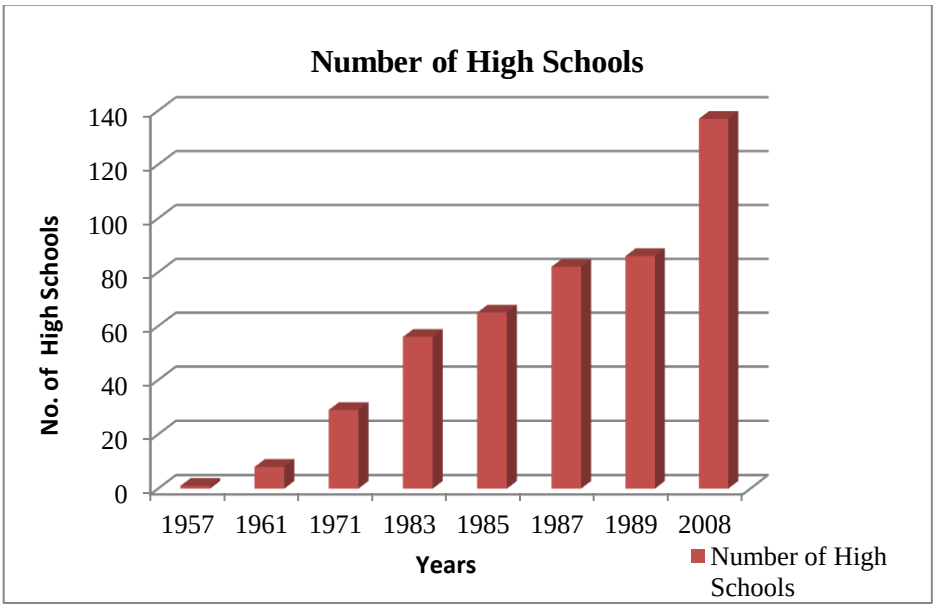


Fig: 1.14

Table 3.17

Block-Wise Secondary Schools in Karbi Anglong District, 2011 & 2016

Sl.No	Name of C.D Blocks	Total No of Schools		Urban area	Rural area
		2011*	2016**	2016	2016
1	Amri	13	4	0	4
2	Bokajan	07	18	3	15
3	Chinthong	05	10	2	8
4	Howraghat	15	17	1	16
5	Lumbajong	13	16	7	9
6	Nilip	05	7	0	7
7	Rongkhang	29	15	1	14
8	Rongmongve	01	8	0	8
9	Samelangso	07	7	0	7
10	Socheng	01	10	0	10
11	Langchomepi	01	6	0	6
	Total	**97**	**118**	**14**	**104**

Source: * District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India, 2011, Assam

** Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu

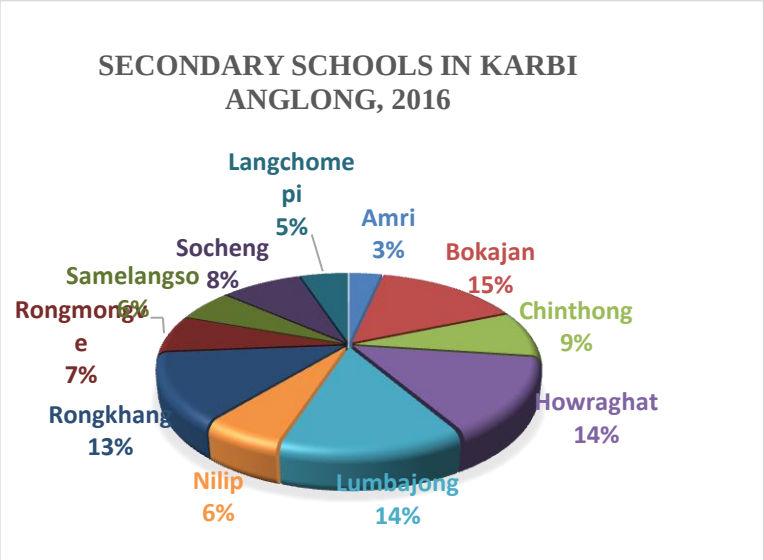


Fig: 1.15

Table 3.18

Rural Area-wise Secondary Schools in Karbi Anglong District, 2016

	RURAL AREA	
Sl. No.	Name of C.D Blocks	Rural area
1	Amri	4
2	Bokajan	15
3	Chinthong	8
4	Howraghat	16
5	Lumbajong	9
6	Nilip	7
7	Rongkhang	14
8	Rongmongve	8
9	Samelangso	7
10	Socheng	10
11	Langchomepi	6
	Total	**104**

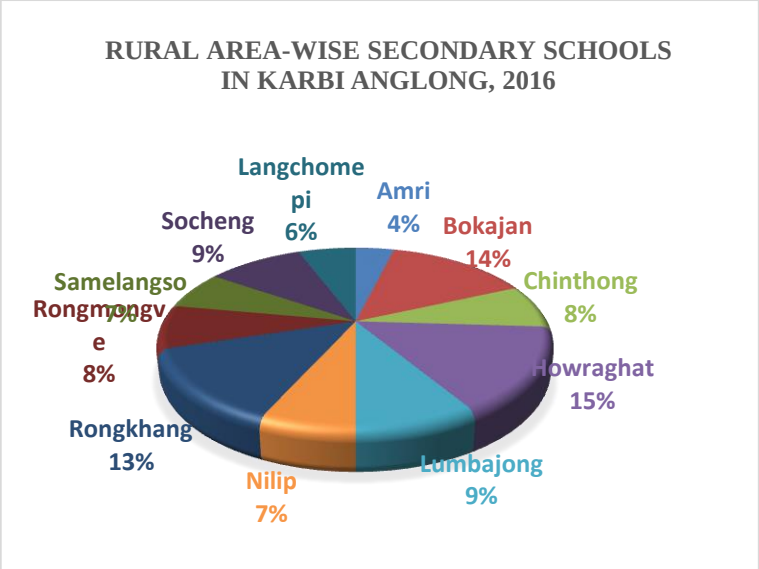


Fig: 1.16

Table 3.19

Urban Area-wise Secondary Schools in Karbi Anglong District, 2016

	URBAN	
Sl. No.	Name of CD Blocks	Urban area
1	Amri	0
2	Bokajan	3
3	Chinthong	2
4	Howraghat	1
5	Lumbajong	7
6	Nilip	0
7	Rongkhang	1
8	Rongmongve	0
9	Samelangso	0
10	Socheng	0
11	Langchomepi	0
	Total	**14**

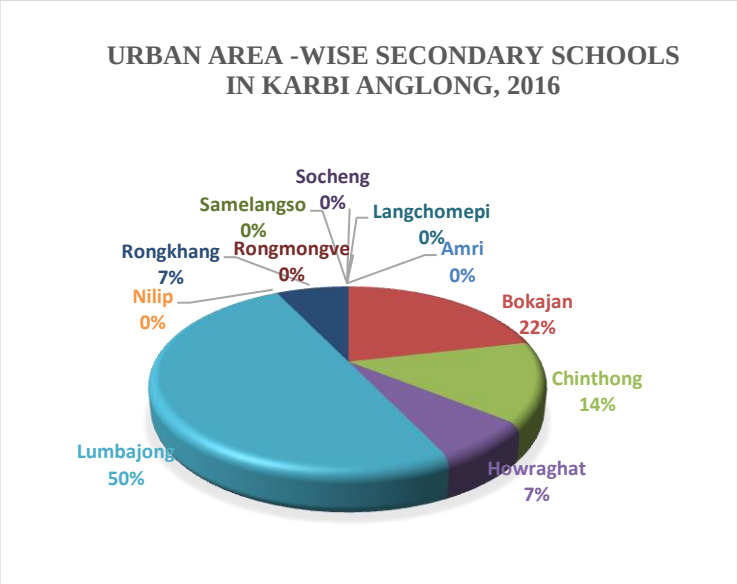


Fig: 1.17

4.3.4 HIGHER SECONDARY EDUCATION IN KARBI ANGLONG

Higher Secondary School is understood to be the gateway to higher education. It provides education up to class XII. Presently, the State is following 10+2+3 education system[26]. Following present education system, the age group for higher secondary school education falls between 16-18 years.

The National Policy on Education (NPE), 1986 laid down the new education structure i.e. 10+2+3 where the first stage is 10 years including two stages of + 4 and + 6 years. The first part i.e. + 4 years are for Primary education and next part i.e. + 6 years for Secondary education. The second stage in the educational structure is for Higher Secondary education of two years and the third stage is for Three Years Degree course. According to the National Policy on Education, (NPE), 1986 Navodaya Vidyalayas are established in each district Head Quarters to give opportunities of free education to rural meritorious students. [27]

At present, the study area has 12 Government's Provincialized and Recognized Higher Secondary Schools out of which 1 is Govt., 9 Provincialized and 2 Recognized by the District Council.[28] **(Table 3.20)**. Besides, there are also a good number of important Higher Secondary Schools/Junior Colleges which are run by both central govt. and private organization in the district **(Table 3.24).** Some of the Higher Secondary Schools/Junior Colleges may be mentioned as have been shown in plate (**plate: 6, 7, 11, 12, 13**,).

In the following passages, an attempt has been made to include all the Higher Secondary Schools located in the district, including the State Govt. run and Private institutions. The following Table **(Table 3.21),** Block wise-distribution of Higher Secondary Schools show a little increase in the total number of Higher Secondary Schools in the district. Altogether, there was a total of only13 Higher Secondary Schools in 2011 which has gone up to 28 in 2016. Out of these 13 numbers of Higher Secondary Schools, 4 were located in Diphu Sub Division, 1 in Bokajan Sub Division and 8 in Hamren Sub Division. In absolute number, Rongkhang CD Block with 6 Higher Secondary had the highest number of Higher Secondary Schools during 2011. On the contrary, more than fifty percent (50%) of the CD Block had registered 0 (zero) figure schools. During the period of 2016, there was however little increase in the number of Higher Secondary Schools in the district. In absolute terms, the total figure increased

from 13 to 28. Amongst the CD Blocks, Lumbajong block recorded the highest number Higher Secondary Schools i.e. 6 (21%) whereas, zero (0%) was recorded in Rongmongve CD Block (**Fig 1.18)**. The rural and urban wise distribution reveals that the concentration of the Higher Secondary schools in the district were 43 percent in urban areas and 57 percent in rural areas.

From the above analysis, it is clearly observed that the present numbers of Higher Secondary Schools in the district is not sufficient for the population size and needs of the people of the district. Moreover, it is found from the study that, there are gaps in the distributions of these institutions as per the demand of the people in the region. Looking into the insufficient number of the Higher Secondary Schools and its location/distributional position, more number of Higher Secondary institutions in the district may be established for the benefit of the people of the entire region. Some of the important Higher Secondary schools/Junior colleges in the district have been shown in **plate: 6, 7, 11, 12, &13.**

Table 3.20

Table showing Important Higher Secondary Schools

Sl. No.	Name of Institutions	Year of Establishment
1	Diphu Govt. Boys Higher Secondary School	1956
2	Rengbonghom Higher Secondary School	1972
3	D.A.V Higher Secondary School	1969
4	Bokaliaghat Higher Secondary School	1956
5	Howraghat Higher Secondary School	1957
6	Dokmoka Higher Secondary School	1961
7	Bokajan Higher Secondary School	1959
8	Dhansiri Higher Secondary School	2005
9	Balipathar Higher Secondary School	1959
10	Tumpreng Higher Secondary School	1963
11	Baithalangso Higher Secondary School	1963
12	Hamren Govt. Higher Secondary School	1974

Source: Office of the Inspector of Schools, Diphu, Karbi Anglong

Table 3.21

Block-Wise Higher Secondary Schools in Karbi Anglong, 2011 & 2016

Sl.No	Name of CD Blocks	Total No of Schools		Urban area	Rural area
		2011*	**2016****	**2016**	**2016**
1	Amri	02	1	0	1
2	Bokajan	01	5	4	1
3	Chinthong	0	2	0	2
4	Howraghat	0	5	2	3
5	Lumbajong	02	6	4	2
6	Nilip	0	2	0	2
7	Rongkhang	06	4	1	3
8	Rongmongve	0	0	0	0
9	Samelangso	02	1	0	1
10	Socheng	0	1	0	1
11	Langchomepi	0	1	1	0
	Total	**13**	**28**	**12**	**16**

Source: * District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

** Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu

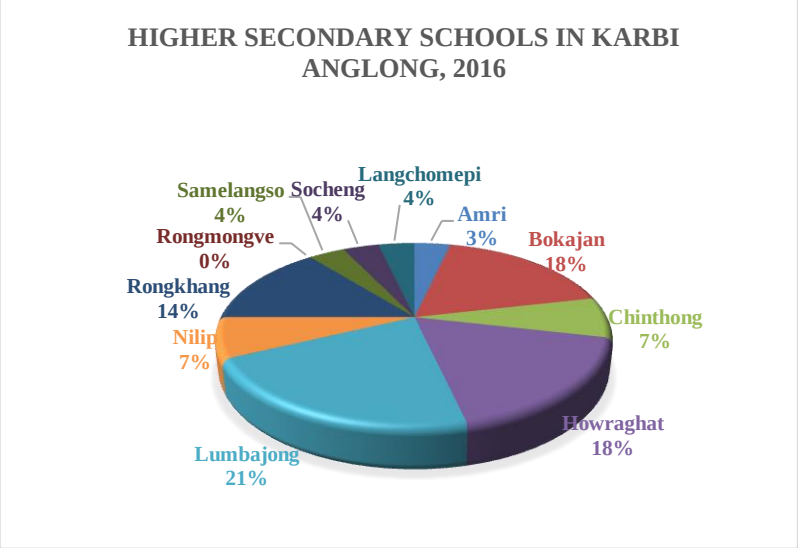


Fig: 1.18

Table 3.22

Rural Area-wise Higher Secondary Schools in Karbi Anglong, 2016

	RURAL AREA	
Sl. No.	Name of CD Blocks	No. of Schools
1	Amri	1
2	Bokajan	1
3	Chinthong	2
4	Howraghat	3
5	Lumbajong	2
6	Nilip	2
7	Rongkhang	3
8	Rongmongve	0
9	Samelangso	1
10	Socheng	1
11	Langchomepi	0
	Total	**16**

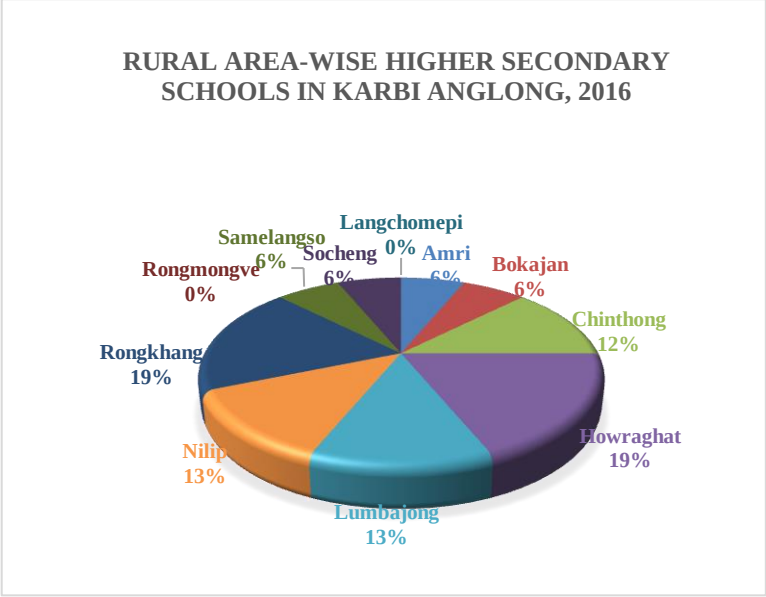


Fig: 1.19

Table 3.23

Urban Area-wise Higher Secondary Schools in Karbi Anglong, 2016

	URBAN AREA	
Sl. No	Name of CD Blocks	No. of Schools
1	Amri	0
2	Bokajan	4
3	Chinthong	0
4	Howraghat	2
5	Lumbajong	4
6	Nilip	0
7	Rongkhang	1
8	Rongmongve	0
9	Samelangso	0
10	Socheng	0
11	Langchomepi	1
	Total	**12**

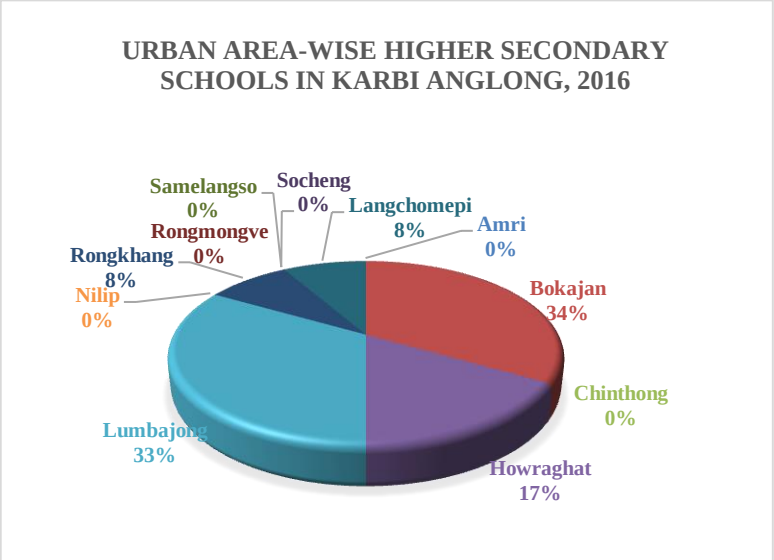


Fig: 1.20

Table 3.24

Higher Secondary Schools and Jr. Colleges in Karbi Anglong District

Sl. No.	Name of Institutions	Year of Establishment
1	Don Bosco HSS, Sojong	1963
2	Donkamokam HSS	2004
3	Manja Jr. College	2005
4	Don Bosco HSS, Diphu	1973
5	J.N.V, Diphu	1995
6	K. V. ,Diphu	1978
7	Kapili Jr. College	1995
8	Kheroni Jr. Sc College	2009
9	Rangsina Jr. College	1983
10	Don Bosco HSS Manja Rd	2015
11	Singkiri Jr, College	2013

4.3.5 HIGHER EDUCATION IN KARBI ANGLONG

It is widely believed that the single most important indicator of the country's future may well be the state of its Higher Education. The Higher Education is concerned with the education provided by the Colleges and Universities. To-day, therefore, the demand for Higher Education in anywhere in the world, whether liberal or technical has been large and rapid. The goal of Higher Education in broad terms are to seek and cultivate new knowledge to provide the society with competent men and women trained in agriculture, medicines, science & technology and the various other professions and to promote equality and social justice.[29]

The National Policy on Education (NPE) 1986 has underlined the importance of Higher Education as crucial factor for survival, because of its potentiality to contribute to "National development through dissemination of specialized knowledge and skills".

Higher Education provides people with an opportunity to reflect on the critical social, economic, cultural, moral and spiritual issues facing humanity. It contributes to the national development through dissemination of specialized knowledge and skills. It is the apex of the educational pyramid.[30]

Thus, to meet the needs of the developing society, Higher Education in any region should be given much importance. The National Policy on Education (NPE) 1986 was formulated to equip the country both scientifically and economically to enter the 21st century. It is highlighted that, "education must promote national cohesion and work ethic. The grandeur of our freedom struggle and its significance for national integration has to be brought home to every student. Our schools and colleges should acquire activities heritage and culture"[31].

In the following pages, Higher Educational facilities in the study area have been explained delimiting only to the well-known Colleges (comprising of Arts, Science and Commerce streams) leaving out the medical college, agriculture university etc**. (Table 3.25).**

Table 3.25

Location of well-known Jr Colleges/Colleges and Other Educational Institutions in Karbi Anglong District

Sl. No.	Name of College & University.	Location	Year of Establishment
1	Assam University, Diphu Campus	Diphu	2007
2	Diphu Govt. College, Diphu	Near PHE Colony	1964
3	Diphu Girls' College, Diphu	Dharamnala, Diphu	1992
4	Diphu Arts & Commerce College	Amalapatti, Diphu	2002
5	Diphu B. Ed College	Diphu	1994
6	Diphu Law College	Diphu	1979
7	I.T.I, Diphu	Diphu	1964
8	Renu Terangpi Memorial College	Diphu	2008
9	Rangsina College	Donkamokam	1983
10	Thong Nokbe College	Dokmoka	1984
11	Bokajan College	Sarihajan, Bokajan	1991
12	Rukasen College, Bakaliaghat	Bakalia	1992
13	Howraghat College	Howraghat	1994
14	Kopili Jr. College, Phelangpi	Kheroni	1995
15	Eastern Karbi Anglong College	Sarihajan, Bokajan	1997
16	Waisong College	Hamren	1994
17	Semson Sing Engti College	Baithalangso	1999
18	Harlongbe Varlongbe College	Deithor	2008
19	Pranab Jubilee College	Bokajan	2012
20	Diphu Polytechnic	Diphu	2007

Source: Researcher's Personal computation based on Field Survey information

Table 3.26

Block wise Colleges and other Educational Institution in Karbi Anglong, 2011 & 2016

Sl. No	Name of Blocks	Total Number		Urban Area	Rural Area
		2011*	2016**	2016	2016
1	Amri	0	0	0	0
2	Bokajan	0	3	3	0
3	Chinthong	01	0	0	0
4	Howraghat	0	1	1	0
5	Lumbajong	0	9	9	0
6	Nilip	0	1	1	0
7	Rongkhang	01	4	4	0
8	Rongmongve	0	0	0	0
9	Samelangso	01	1	1	0
10	Socheng	0	0	0	0
11	Langchomepi	0	1	1	0
	Total	**03**	**20**	**20**	**0**

Source: * District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam
** Researcher's Personal computation based on Field Survey information

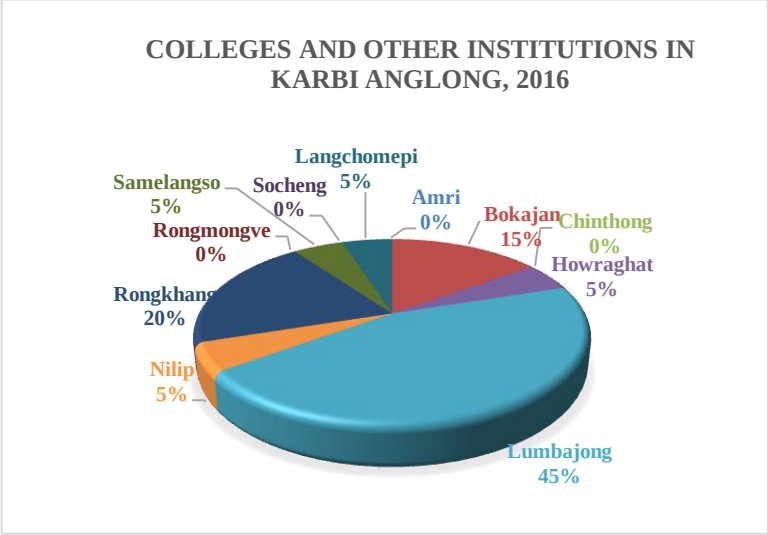


Fig: 1.21

As explained in the forgoing pages, the present study has been delimited only to the well-known Colleges (comprising of Arts, Science and Commerce streams). The present study does not include Professional educational institutions.

The district Karbi Anglong being one of the two hill districts of Assam, which had been given special status under the Sixth Scheduled of the constitution of India to solve the local problems of higher education since long, and has still been lagging far behind in the development of higher education facilities. The scenario of the educational institutions prior to the Independence in the district was a very griming look. Since there was no formal education in the district, interested students had to go to the neighboring districts to acquire their education. At the same time, however, due to financial problems very few students only could afford to attend, whereas; large numbers of the students were deprived of such education.

It was only after the formation of Karbi Anglong District Council in 1952, which was established for running the local administration that both the State Government and the District Council took the responsibility of education in the district. Since then the higher education has been achieving its importance and some kind of development on the part of education in the district.

Higher education plays a very significant role in the development of thinking, reasoning and judgment of the students. Prior to the Independence, there was no higher education in the district of Karbi Anglong. It was only after the establishment of District Council in 1952 that has played the major role in the development and progress of higher education in the district. **Table 3.25** reveals that, since 1983, progressively numbers of general colleges have been set up and it has been noticed that higher education has remarkable development in the district. At present there are 15 Colleges in the district, out of which 1 is Govt. College, 6 ad-hoc and 8 recognized. Apart from these, there is I.T.I, Polytechnic, Law College, and B. Ed college with 1 each and 1 University Campus, i.e. Assam University, Diphu Campus in the district. Amongst these Colleges, Diphu Govt. College (**plate: 1**), the only premier college located at the vicinity of the town in the district can be mentioned as the first higher educational institution and the only Government Degree College which imparts education not only for Degree courses (Arts, Science and Commerce), but also for Higher Secondary courses. It was established with only a handful of students in 1964. Though the progress of the college in the beginning was very slow and unimpressive, it picked up its momentum with the construction of various infrastructure facilities like, construction of Staff Quarters, hostels for students and the college buildings. Diphu Govt. College however, has been the centre of higher education in the entire district for the last 55 years and so. At present, there are two girls'

hostel, one boys' hostel, twenty three Govt. quarters for teaching staffs and six quarters for non-teaching office staffs.

Following the footsteps of Diphu Govt. College, many other important colleges also came up gradually one after another in the past decade of the 20th century. After Diphu Govt. College, Rangsina College (**plate: 5**) is the second oldest college in the district and until 1995 this college was the only college in the entire Hamren sub-division of West Karbi Anglong. Thereafter, in 1994 Waisong College came into existence at Hamren and two more colleges namely, Kopili College (1995) at Kheroni and Semson Sing Engti (1999) at Baithalangso within the Sub-division were established. In the eastern part of the district, similar type of general degree colleges was established one after another. In 1984, Thong Nokbe College, the third oldest college in the entire district at Dokmoka was established followed by colleges namely, Bokajan College (1991) at Bokajan, Ruksen College (1992) **(plate: 4**) at Bakulia, Diphu Girls' College (1992) at Dharamnala Diphu, Howraghat College (1994) at Howraghat, and Eastern Karbi Anglong College (1997) at Sarihajan were established respectively. Some of these colleges were initially affiliated to Guwahati University (GU) but have presently come under the affiliation of Assam University (AU), Silchar, Assam.(**Fig:1.14)**.

A few years later, a remarkably new beginning in the history of education could also be seen with the opening of Assam University campus i.e. Diphu Campus at Diphu, Karbi Anglong in 2007. By opening of the University campus, the long cherishing demand and wishes of the people especially the student communities of the entire district became reality finally on 18th July 2007. Presently the Diphu Campus has the following departments - English, Political Science, Physics, Commerce, History, Life Science, Geography, Anthropology, and Assamese Departments. All these departments not only impart Post graduate teaching but also provide facilities for pursuing M.Phil and Ph.D Research works. Besides these, a Tribal study centre was also introduced in the year 2010-11 for undertaking and promoting research works for the development of tribal language of the region.

On analyzing the location and distribution of the entire educational facilities and functions in the district, it is observed that, the distribution of Higher Secondary Schools and colleges are not evenly distributed across the entire district. In absolute terms, the table (**Table 3.21 & 3.26)** reveals that, there is a wide gap in the block wise distribution

of educational institutions in the entire district. This leaves Amri, Rongmongve and Socheng CD Blocks without any number of colleges. The Rural and Urban-wise distribution of colleges also shows that, all these institutions are concentrated only in urban areas leaving out rural areas to nil (zero). In case of the distribution of these institutions, as Table (**Table 3.26)** shows, an overall increase can however be seen for the entire district, between 2011 and 2016. The highest number has been observed in Lumbajong Block with 9 (45%) colleges followed by Rongkhang Block with 4 (20%) colleges in 2016 **(Fig: 1.21)**. But, unfortunately, it is observed that, four CD Blocks – Amri, Chinthong, Rongmongve and Socheng Blocks have not recorded any number of colleges in their areas during the period.

Looking at the uneven distribution of the number of colleges in the entire district, both block-wise as well as urban and rural-wise, it is clearly found that the existing number of colleges is not at all sufficient compared to the population size and demand of the people in the district. The study further reveals that, the uneven distribution of present number of colleges in the district is a reflection of both geographical locations and management on the part of govt. machineries/authorities that needs to be properly identified and implemented for the benefit of the student community living in the region. The study further reveals that, the entire distribution of the educational institutions across the district is highly dispersed (**Table 3.26**).

From the entire Block-wise analysis of educational facilities, it is observed that, there are spatial disparities in almost every distribution of educational facilities in the district. Not only that, there is also disparity in both urban-wise as well as rural-wise distribution of these educational facilities. As a result, most of the CD Blocks have since long years been seen to be out of the reach of these education facilities, and have been neglected and deprived of getting such facilities.

Furthermore**,** the data showed in **Table 3:27** reveals the Town Area-wise distribution of educational institutions in the district as per 2011. The Table reveals that, there are Six Tows and one Census Town (CT), namely, Hamren, Donkamokam, Diphu, Bokajan, Laharijan Natun Bosti (CT), Howraghat, and Dokmoka with a total population of 1,12,966 and a total geographical area of 37.45 sq. km in the district. Out of these Six Towns, Diphu Town (Lumbajong CD Block) having the largest area (16.48 sq. km) as well as highest population (61,797) ranks the highest in number of both Govt. as well as

Private educational institutions. In absolute number, out of the total of 85 Primary Schools, 55 Primary Schools are Govt. and 30 are Private Primary Schools. Of these, Diphu Town with 20 numbers of Govt. Primary Schools and 15 numbers of Private Primary Schools recorded the highest numbers of Primary Schools followed by Hamren Town with 10 Govt. and 4 Private Primary Schools, whereas the lowest numbers of Primary Schools in both Govt. and Private Schools have been found in Howraghat Town area which records 3 and 1 Primary Schools respectively. Similarly, in case of Middle Schools, Secondary Schools, Higher Secondary Schools and Colleges also Diphu Town area has shown as the highest in numbers of educational institutions amongst the Town areas in the district. It is to be mentioned here that, with its existing socio-economic facilities/amenities Diphu, the District Head Quarters is located in this Diphu Town area which has favoured Diphu Town to record the highest numbers of educational facilities in comparison to other Towns in the district. Meanwhile, in terms of availability of educational institutions, it was found that, Diphu Town out numbers the other towns in all the categories of educational facilities in the district. Looking into the total numbers of educational institution, it has been observed that, Laharijan Natun Bosti (CT) fared poorly in all counts followed by Bokajan Town with 42 numbers of educational institutions after Diphu Towns with 84 numbers of educational institutions in the district. On the whole, the Town Area-wise distribution of educational institutions however, is a reflection of the physical and human conditions. The study reveals that, the Town area-wise distribution of the educational institutions across the district is highly dispersed (Table **3.27**).

Table 3.27

Town Area wise distributions of Educational Institutions in Karbi Anglong District, 2011

Town Name	Area (sq. km.)	Total Population of Town	Govt. Pr School	Private Pr School	Govt. Middle School	Private Middle School	Govt. Sec School	Private Sec School	Govt. Senior Sec School	Private Senior Sec School	Govt. Degree College-(Arts, Sc & Com)	Private Degree College-(Arts, Sc. & Com)
Hamren	10	8747	10	4	2	2	2	0	1	3	0	0
Donka mokam	4	9116	9	2	2	0	1	0	1	1	0	0
Diphu	16.48	61797	20	15	13	16	6	6	3	1	1	3
Bokajan	3	19877	9	6	12	7	3	1	3	1	0	0
Lahari janNatun Bosti(CT	0.46	2508	0	0	0	0	0	0	0	0	0	0
Howragha t	1.51	5443	3	1	3	1	2	0	1	1	0	1
Dokmoka	2	5478	4	2	1	1	1	1	1	1	0	0
TOTAL	**37.45**	**1,12,966**	**55**	**30**	**33**	**27**	**15**	**8**	**10**	**8**	**1**	**4**

Source: Researcher's Personal computation based on District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam and Axom Sarba Shiksha Abhijan Mission, Karbi Anglong Autonomous Council, Diphu (2016)

LOCATION MAP OF COLLEGES AND OTHER EDUCATIONAL INSTITUTIONS IN KARBI ANGLONG DISTRICT

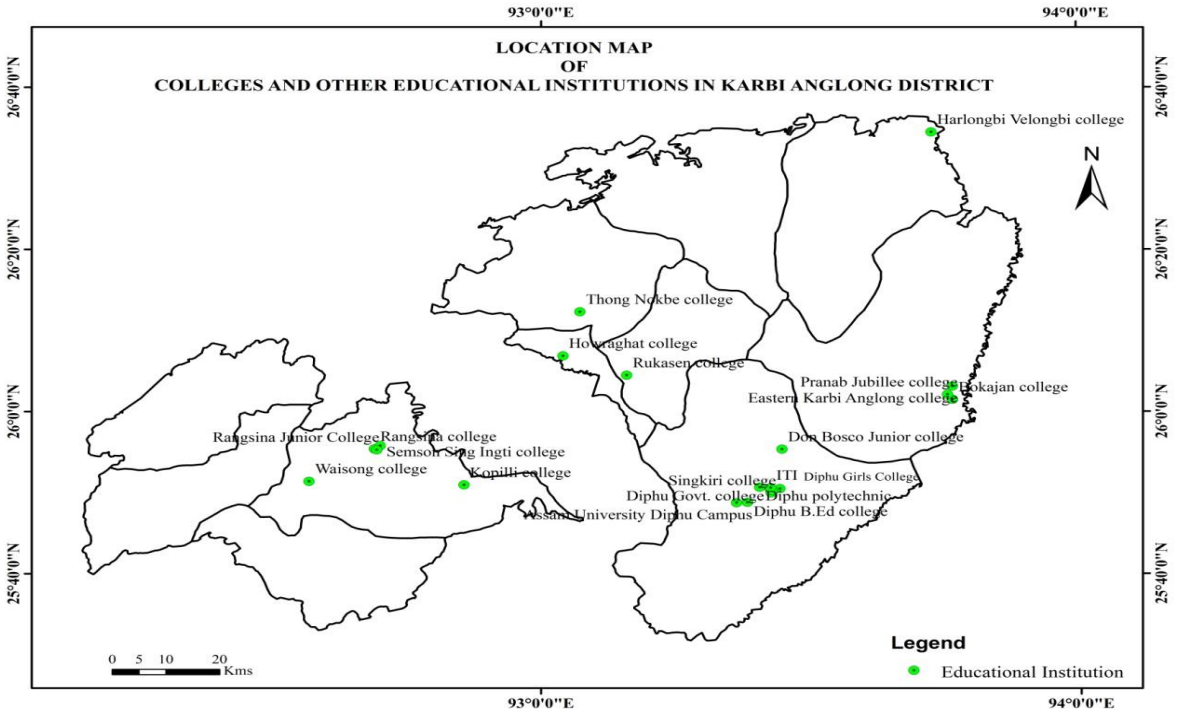


Fig: 1.14

Source: Survey of India Map, 2013

4.4 SPATIAL ANALYSIS OF HEALTH INFRASTRUCTURE IN KARBI ANGLONG

Health is a state of complete physical and mental fitness. Health is an important in terms of its association with energy of efficiency of Human beings; it is a basic human right. These facilities play a vital role in maintaining the body of human resources and can be regarded as an important indicator of social and economic well-being. Health is an important aspect of the social development of any area/region. The easy availability of medical facilities is an indicator of relatively better level of development. It is, in fact, recognized as a human capital component, which significantly contributes towards the development of a nation. Health services and other social services and economic considerations that influence the health status of a community are considerably influenced by the nature of the political system of a community.

In the present situation, it is the preventive socio-economic and educational aspects of the healthcare system that are most significant. Health care is the prevention, treatment and management of illness and the preservation of mental and physical well-being through the services offered by the medical, nursing and allied health professions.

Healthcare embraces all the goods and services designed to promote health including, "preventive, creative and palliative interventions, whether directed to individuals or to populations" (WHO). India, the second largest and most populous country in the world, is a bewildering collection of contradiction. In India the people in some regions live in such a situation rather in abysmal conditions that thousands die from preventable and treatable illnesses. Faced with massive problems of ill-health, i.e. the burdens of diseases, Indians have therefore to address the question of how to provide a health infrastructure that is easily accessible to the people. Access to all health services is one of the indexes to achieve the goal of "health for all". There are many barriers to these health services (Fox et al., 2005)[32]. These barriers to the health services differ from region to region, country to country and time to time. These barriers are- availability, accessibility, affordability, acceptability and accommodation. Of these, the last three barriers are known non spatial barriers and reveal socio-economic factors, while, the first two are spatial in nature. In the context of health services, availability refers to the number of health care service point, people in emergency can choose. Accessibility refers to the distance between residential or demand areas and health services or

destinations. In a society that has access and uses good quality health services is more likely to enjoy better health than one that does not. Developed countries that have universal healthcare services have longer life expectancies for their people compared to developed countries that do not. So, the visualization and spatial analysis of health care service explores ways harnessing information and communication technology for community health and development in marginalized communities. The importance of online health services can also be seen in the development of national health system and portals. These provide users with health information, access to medical trained people and personal perspectives from patients and citizens. Patients as well as citizens in general are becoming more knowledgeable and empowered due to new internet health services (Fox et. al., 2005)[33]. By using the internet, people can collect information and advice from different sources, and it is also common to get support online.

Attainment of sound health is the right of every human being and the duty of the state is to provide its citizens due healthcare. The spatial patterning and supply of health services is an aspect of health care that most impinges itself on the consciousness of the consumer. Whereas the consumer may have views on the quality of the care received he or she will most certainly have views about the number of facilities available the location and the times at which they may or may not be available. In the case of low income groups and those primarily concerned with the needs of people the concern achieves more significance and begins to influence the use than can be made of such facilities[34].

Therefore, the present study attempts to describe the health (care) facilities in the district of Karbi Anglong, Assam taking into consideration the availability of data collected from various health related offices in the following manner.

4.4.1 THE LOCATION OF HEALTH FACILITIES

The location of health care facilities is an obvious geographical area of interest. The number the size and the location of health care facilities can have a direct bearing on their utilization and hence on the level of care available to citizens (Joseph and Philips 1984) [35].

Geographers are constantly preoccupied with decisions relating to optimum location and optimization of location. In no field is this more important than in the field of medical provision where the cost of facilities even where inadequate is high. One can see that location is a very important aspect of health service operations, i.e. which is the

best location for a general health centers or a hospital so as to minimize aggregate travel distance time and cost.

4.4.2 SPATIAL DISTRIBUTION OF HOSPITALS IN KARBI ANGLONG

Analysis and prediction of hospitals utilization is a fundamental requirement for effective medical services planning and hospital management. This is probably more existing research on hospital location and patient behavior pattern than on any other form of medical care. This is presumably because of the greater availability of data on which to base such research. The geographical distribution of Hospital services have an effect on the accessibility of the services to the public and the travel cost incurred by the community. The geographical pattern of hospital services in the district is changing because the distribution of population has also been shifted in recent decades.

The facilities of health units/centres determine the quality of people as well as the advancement of the region. The medical/health facilities selected for the present study include mainly Community Health Centres (CHCs), Primary Health Centres (PHCs), Mini Primary Health Centres (MPHCs), Primary Health Sub-centres (PHSCs), Maternity and Child Welfare Centres (MCWCs), State Dispensaries (SDs), Family Welfare Centres (FWCs), and Others which include Veterinary Hospitals and Non-government medical facilities charitable etc. At present, there is a District Civil Hospital i.e. Diphu Civil Hospital (**plate: 25**) located at Diphu under Lumbajong Block in East Karbi Anglong and a Sub-Divisional Civil Hospital located at Hamren under Chinthong Block in West Karbi Anglong. Diphu Civil Hospital was established on 14th August, 1960 and is the only Civil Hospital in the entire district which has been catering/rendering services for the populations in this tribal dominated hilly areas/region; while Hamren Sub-Divisional Civil Hospital established in 1983 located in West Karbi Anglong has also been rendering the same services for the populations of western Karbi Anglong region **(Table 3.28).** Besides this District Civil Hospital (CH) and a Sub-Divisional Civil Hospital located at Hamren under Chinthong Block in West Karbi Anglong, there are also a number of health centres as shown in **plate: 31-51.**

Table 3.28

Health Centres in Karbi Anglong District, 2016

Sl. No.	Name of Heath Centres	Numbers
1	Hospital(CH & SDCH)	02
2	Community Health Centres (CHCs)	05
3	Block Public Health Centres (BPHCs)	05
4	Mini Public Health Centres (MPHCs)	24
5	Subsidiary Health Centres (SHCs)	07
6	State dispensaries (SDs)	07
7	Mini Sub Centres (MSCs)	08
8	Sub Centres (SCs)	137
9	Catholic Health Centre	01

Source: Office of the Joint Director of Health Services, Karbi Anglong, Govt. of Assam

Table 3.29

Health Centre in Karbi Anglong District, 2011

Sl. No.	Name of Heath Centres	Numbers
1	Community Health Centres (CHCs)	03
2	Primary Health Centres (PHCs)	23
3	Primary Health Sub Centres (PHSCs)	37
4	Maternity and Child Welfare Centres (MCWCs)	02
5	State dispensaries (SDs)	11
6	Veterinary Hospitals	12
7	Family Welfare Centres (FWCs)	04
8	Non Govt. Medical facilities Charitable	09

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

Table 3.30

Distribution of Villages according to availability of Medical Facility, 2011

Sl. No	Name of CD Blocks	Total population of inhabited villages	Number of inhabited villages	Medical facility	Percentage to total	Ratio to Population
1	Amri	45573	132	14	10.61	3255.21
2	Bokajan	142409	419	67	15.99	2125.51
3	Chinthong	46553	138	11	07.97	4232.09
4	Howraghat	127673	334	38	11.38	3359.81
5	Lumbajong	93914	417	26	06.24	3612.07
6	Nilip	50057	280	50	17.86	1001.14
7	Rongkhang	158035	201	76	37.81	2079.41
8	Rongmongve	32773	176	21	11.93	1560.61
9	Samelangso	63869	304	31	10.20	2060.29
10	Socheng	27334	76	59	77.63	463.29
11	Langsomepi	55157	235	21	08.94	2627.52
	Total	**843347**	**2712**	**414**	**15.27**	**2037.07**

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

N.B : Medical includes all medical Facilities.

Table 4.31

Number and Percentage of Rural Population served by different facilities, 2011

Sl. No	Name of CD Blocks	Total Populal-tion of inhabi-ted villages	Educati on	Medical	Approa ched by pucca road	Transport communi cation	Post office	Power supply
1	Amri	45573	42038 (92.24)	14069 (30.87)	0 (0)	30984 (67.99)	1322 (2.90)	19654 (43.13)
2	Bokajan	142409	114592 (80.47)	74016 (51.97)	29344 (20.61)	47807 (33.57)	12706 (8.92)	115491 (81.10)
3	Chinthong	46553	43988 (94.49)	10139 (21.78)	1735 (3.73)	28858 (61.99)	0 (0)	22439 (48.20)
4	Howraghat	127673	117539 (92.06)	38274 (29.98)	7271 (5.70)	85079 (66.64)	1160 (0.91)	114441 (89.64)
5	Lumbajong	93914	62933 (67.01)	25936 (27.62)	1893 (2.02)	41714 (44.42)	9455 (10.07)	55480 (59.08)
6	Nilip	50057	38169 (76.25)	9045 (18.07)	0 (0)	14035 (28.04)	0 (0)	27042 (54.02)
7	Rongkhang	158035	155282 (98.26)	109331 (69.18)	49080 (31.06)	104096 (65.87)	29522 (18.68)	146149 (92.48)
8	Rongmongve	32773	23381 (71.34)	4442 (13.55)	0 (0)	10029 (30.60)	0 (0)	17910 (54.65)
9	Samelangso	63869	45369 (71.30)	8484 (13.28)	0 (0)	22846 (35.77)	0 (0)	40782 (63.85)
10	Socheng	27334	25013 (91.51)	21270 (77.82)	1544 (5.65)	8751 (32.02)	1544 (5.65)	3378 (12.36)
11	Langsomepi	55157	45577 (82.63)	13483 (24.44)	5554 (10.07)	26560 (48.15)	0 (0)	40111 (72.72)
	Total	843347	713881 (84.65)	328489 (38.95)	96421 (11.43)	420759 (49.89)	55709 (6.61)	602877 (71.49)

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A Census of India-2011, Assam

N.B:

1. Education includes all education facilities.
2. Medical includes all medical facilities.
3. Post Office includes post office, telegraph office, and post and telegraph office.
4. Transport communication includes bus service, rail facility and navigable water ways.

It is observed that, altogether 414 inhabited villages have been covered by medical centers in the district. The highest coverage figure of 76 (37.81 %) villages by health centres is observed in Rongknang CD Block followed by 67 (15.99%) in Bokajan and 59 (77.63%) in Socheng CD Blocks. The least number coverage are found in two CD Blocks which is less than/below 20 numbers, i.e. 11 (7.97%) in Chinthong and 14 (10.61%) in Amri CD Blocks. But in terms of percentage coverage to the total number of inhabited villages covered by health centre facilities, Lumbajong (6.24%) and Chinthong (7.97%) CD Blocks has the least percentage as compared to other CD Blocks (**Table 3.30**).

Looking at the number and percentage of rural population coverage/ serve by health facilities in the district, it is found that only three blocks have more than 50 percent coverage of the population served by the facilities, while the rest have below 50 percent. The CD Blocks having more than 50 percent rural population served by these facilities are Socheng block 21270 (77.82%), Rongkhang CD Block 109331(69.18%) and Bokajan CD Block 74016 (51.97%) respectively. The blocks having least percentage coverage of rural population served by these health facilities are observed in Samelangso CD Block 8484 (13.28%) and Rongmongve CD Block 4442 (13.55%). Furthermore, the study shows that in both of these blocks, there are no pucca road connectivity and post office facilities. From the table **(Table 3:31),** it is observed that, Amri, and Nilip CD Blocks are also far off from pucca road connectivity facility. The study reveals that, half of the rural population in the district are not served properly by health facilities and means of transport and communication facilities as well, which are essential for every human being for attainment of sound health.

4.4.3 SPATIAL DISTRIBUTION OF DISPENSARIES IN KARBI ANGLONG

Dispensaries are the place where patients are treated and medicines provided but with no in-patient facility and are the points of first contact for most the consumers or patients. It is a place connected with the hospital from which medical supplies and medicines are dispersed.

In the study area, so far as Dispensaries are concerned, there are 7 Dispensaries (SDs) distributed in two circles, i.e. 3 in Silonijan and 4 in Donka circles **(Table 3.28).** Here the distributional patterns are found uneven as per Circles, or CD Blocks are concerned. The present numbers of dispensaries in the entire district are found to be

located in very remote areas, namely, Kolonga SD (Donkamokam BPHC), Borgaon SD (Umpanai BPHC), Rongjangphong SD (Umpanai BPHC), Khanduli SD (Baithalangso BPHC), under Donka circles in West Karbi Anglong whereas, Borpothar SD (Bokajan BPHC), Dhillai SD (Bokajan BPHC), and Deithor SD (Chowkihola BPHC) are under Silonijan circle in East Karbi Anglong. These Dispensaries are located in such areas where the areas are not easily accessible by road transportation connectivity especially under Donka circles in West Karbi Anglong area (**Fig: 1.15).** Understanding the present spatial distributional patterns of Dispensaries, there is an urgent need to establish more number of dispensaries in these tribal dominated hilly areas especially in those areas and localities where there are no hospitals facilities, as because dispensaries are the place connected with the hospital from which medical supplies and medicines are dispersed. The study also reveals that, there are marked disparities in the availability of not only in dispensaries but also in other health facilities which have now been the major problem especially in remote areas and localities in the entire district.

4.4.4 SPATIAL DISTRIBUTION OF CHCs, BPHCs, MPHCs AND SHCs IN KARBI ANGLONG

Community Health Centres (CHCs) are designed to provide referral health cares from PHCs and those in need of specialist health care approaching the CHCs directly. Under this centre, 4 PHCs are included catering for approximately 80,000 populations in tribal/hilly areas and 1, 20,000 populations for plain areas. CHC is a 30-bedded hospital which provides specialist care in Medicine, Obstetrics and Gynecology, Surgery and Paediatrics.[36] On the other, a Primary Health Centre is the first contact points between a village community and the government medical officer that covers a population of 20,000 in hilly, tribal or difficult areas and 30,000 populations in plain areas with 4 - 6 indoor/observation beds. A Primary Health Centre acts as a referral unit for 6 sub-centres with a Medical officer and Para medical staff .[37]

As previously mentioned various medical/health facilities selected for the study, there are altogether 5 numbers of Community Health Centres (CHCs), 5 Block Primary Health Centres (BPHCs), 24 Mini Primary Health Centres (MPHCs) and 7 Subsidiary Health Centres (SHCs) in the entire district (**Table 3.28).** These health institutions are however unevenly distributed across the region. Out of these 5 numbers of CHCs, 3 are found at three different localities, namely, Bakalia CHC (**plate: 33**), Dentaghat CHC and Howraghat CHC (**plate: 32**) under Phuloni circle and the others 2 namely, Donkamokam

CHC **(plate: 48**) and Bokajan CHC are found one each in Donka and Silonijan circles. On the other, most of the BPHCs are found mainly in Donka circle of West Karbi Anglong and one each in Lumbajong (Diphu) and Silonijan (Chowkihola) circles. There are altogether 24 Mini Primary Health Centers (MPHCs), in the district. These health centres are found almost equally distributed in all the three circles except at Diphu in Lumbajong Circle. In absolute number, amongst the four circles, the highest number of MPHCs, 9 is found in Donka circle and the least number in Lumbajong circle. At present, Lumbajong circle has only 2 existing MPHCs which are located at Dhansiri and Borlangfer under Manja BPHC. Next to MPHCs, the Subsidiary Health Centres (SHCs) are distributed only in three circles, namely, Tumpreng SHC, Mailoo SHC and Kheroni SHC under Donkamokam BPHC (**plate: 48**) in Donka Circle and Balijuri SHC, Tekelangjun SHC and Okreng SHC under Howraghat BPHC (**plate: 32**) in Phuloni circle and Mohongdijua SHC(**plate: 29**) under Manja BPHC (**plate: 26**) in Lumbajong circle. Silonijan circle has not been provided any MPHCs. Besides these health centres discussed above, there are also a total of 137 Sub Centres (SCs) and 8 Medical Sub Centres (MSCs) distributed under different BPHCs in the district of Karbi Anglong. Out of these 137 Sub Centres, 44 SCs have been found in Donka Circle followed by 42 SCs in Phuloni, 30 SCs in Silonijan and 21 SCs in Lumbajong Circles respectively. In case of 8 numbers of Medical Sub Centres (MSCs), 4 are located in Donka Circle followed by 2 in Silonijan and 2 in Phuloni Circles. There is also a private run Hospital i.e. Catholic Hospital under Manja BPHC in Lumbajong circle (**Table 3.28)**.

To carry out the study further, besides these various medical/health facilities located under different CD Blocks/Circles as described above, the data for Town area-wise distribution of health institutions in Karbi Anglong District **(Table 3.32)** reveal that, there are 6 numbers of Hospitals (Allopathic), 9 Dispensaries, 6 Family Welfare Centres (FWCs), 1 Maternity and Child Welfare Centres (MCWCs) and 4 Veterinary Hospitals distributed in different Town areas in the district. The Table further shows that the distribution of these health centres across the towns are almost evenly distributed except Laharijan Natun Bosti (CT) followed by Dokmoka and Donkamokam Towns. It has also been observed that, amongst the six towns, Laharijan Natun Bosti which is the only Census Town (CT) fared poorly in all counts. On a closer look, Laharijan Natun Bosti (CT), it was found that and to some extent, has showed the need for further improvements of health services followed by Dokmoka and Donkamokam Towns.

Table 3:32

Town Area-wise distribution of Health Institutions in Karbi Anglong District, 2011

Name of Towns	Area (sq km)	Total popula-tion of Town	Hospital Allopathic (Number)	Dispensary /Health centre (Number)	Family Welfare Centre (Number)	MCW Centre (Number	Veterinary Hospital (Number)
Hamren	10	8747	1	2	2	0	1
Donkamokam	4	9116	1	1	1	0	0
Diphu	16.48	61797	1	1	1	0	1
Bokajan	3	19877	1	2	1	1	1
Laharijan Natun Bosti (CT)	0.46	2508	0	0	0	0	0
Howraghat	1.51	5443	1	2	1	0	1
Dokmoka	2	5478	1	1	0	0	0
Total	**37.45**	**112966**	**6**	**9**	**6**	**1**	**4**

Source: District Census Hand Book, Karbi Anglong, Series-19, Part XII-A
, Census of India-2011, Assam

Looking in to the unevenness in the distribution of these health facilities, in general, it is understood that, there are marked disparities in the availability of health facilities which have now been the major problem especially in remote areas and localities in the entire district. Therefore, there is an urgent need to improve and provide these facilities to every citizen in the region.

An attempt has been made therefore to study the location/distributional aspects of all these above discussed facilities in the following passage by considering its two main attributes –

i) the number of specific facilities per unit of area, called density of facility and,

ii) the location of these facilities/amenities and their intensities.

Table 3.33

Health Institutions in Karbi Anglong District, 2016

Sl. Nos.	Name of Heath Institutions	Numbers
1	Community Health Centre (CHC)	05
2	Block Public Health Centre (BPHC)	05
3	Mini Public Health Centre (MPHC)	24
4	Sub Health Centre (SHC)	07

Source: Office of the Joint Director of Health Services, Karbi Anglong, Govt. of Assam

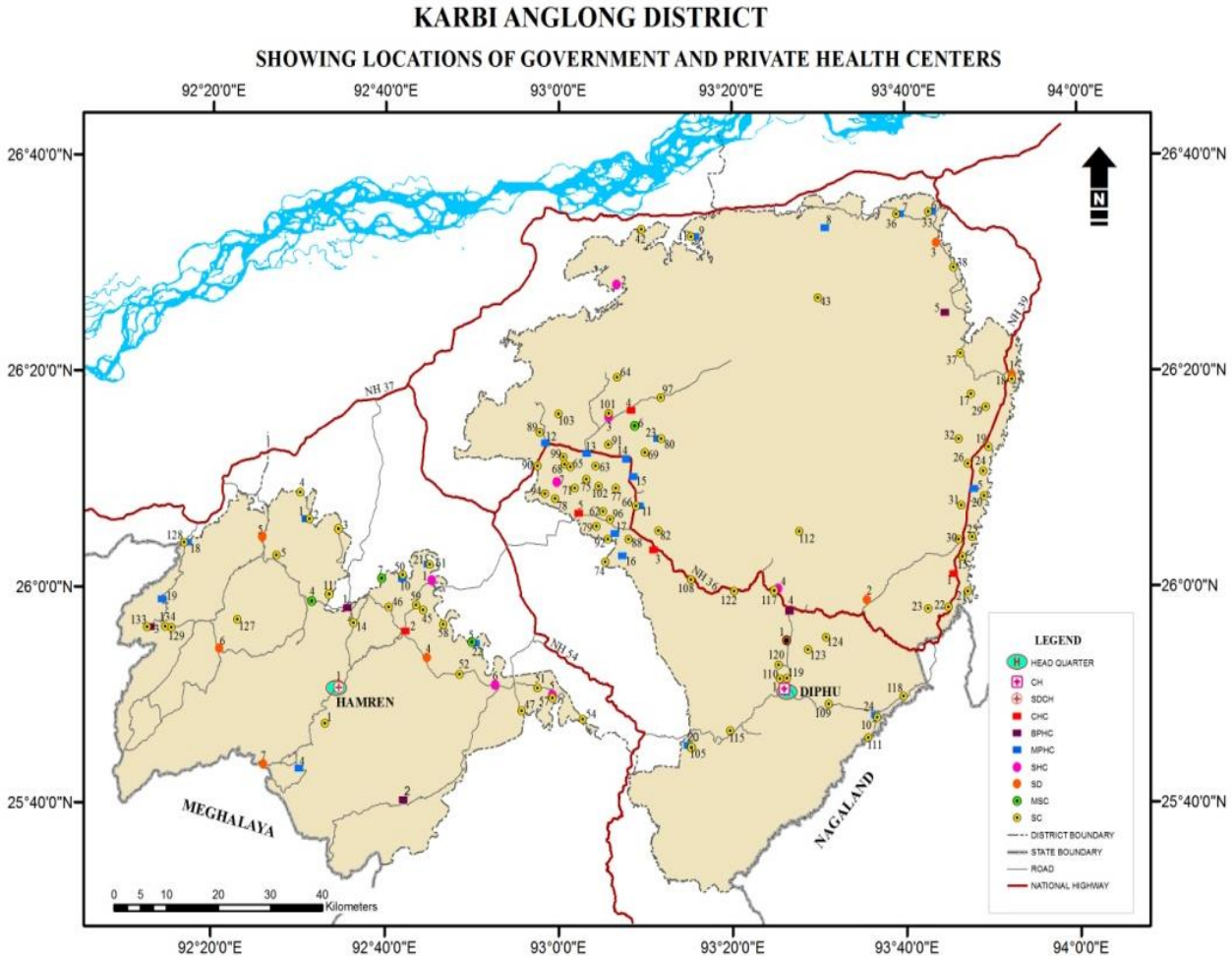


Fig: 1.15

Source: Survey of India

4.5 METHODS

As mentioned in the previous discussion, to test the validity further of the above premise of the location patterns of various functional facilities in the study area, simple cartographic methods have been adopted. Before analyzing these facilities, first, all the facilities/amenities are classified according to the given scheme **(Table 3.2)** and their location/distributional patterns have been shown with the help of preparing distributional maps base on 2011. The changing natures of the distribution of the facilities have also been described. The salient features of the distribution of these facilities have also been shown by drawing simple Graphs and Diagrams. Further, the spatial patterns of the facilities have been studied in relation to population size distribution of the study area. The spatio-functional patterns have been described in the next chapter of the present study.

The location/distributional aspects of all these facilities/amenities are further described here by considering its two main attributes. These are -

i) The number of specific facilities per unit of area, called density of facility*. The distribution of functional density is also comparable to the distribution of population density, and;

ii) the location of these facilities/amenities and their intensities**.

- Density is related to area. Therefore, total number of a specific facility available per unit area is calculated.

** Location intensity of these facilities/amenities has been calculated by dividing total number of facility available by total number of locations having this specific facility in the area.

4.5.1 (a) DENSITY OF FACILITIES/AMENITES IN KARBI ANGLONG DISTRICT

In the present study, the densities of **education** and **health** facilities have been calculated by taking the total number of facilities per 100 sq. km for each CD Block. Following the procedures of calculation, it is observed that, the average density of Primary Schools in the district was 90 only per 100 sq. km in 2011 which has increased to 98 per 100 sq. km in 2016 **(Table 3.34).** In absolute figure, the highest increase in the density of primary schools has been observed in Socheng CD Block, i.e. 59 per 100 sq. km to 130 per 100 sq. km. which is very high compared to other CD Blocks. But, the average density in case of Middle Schools has revealed reverse figure from 20 per100 sq.km in 2011 to 18 per100 sq.km in 2016 i.e. 2 less than previous year 2011. The reason of decrease in the density of middle schools may be due to up gradation of the present level to the next higher level of schools. Amongst the CD Blocks, the density of middle schools was recorded highest in Socheng Block (42.51) in 2016. It is noticeable from the study that, the average density of High schools was less than 5 per100 sq.km in 2011 which was increased to little more than 5 per100 sq.km in 2016. Even in the case of Higher Secondary Schools, the rate of increase in the density per 100 sq. km was very negligible. The density of Degree Colleges per 100 sq. km was found to be recorded average from 0.15 in 2011 to 1.00 in 2016. Many new entries of Degree colleges and other educational institutions have been however observed during 2016 which shows comparatively much better position than 2011. In absolute terms, on the whole, it is observed that, Socheng CD Block has shown much increase in the density of educational facilities compared to other blocks in the entire district. **(Table 3.34)** It can therefore clearly be noted and described here that, the number of educational facilities as well as the density of these educational facilities in the district has been increasing averagely though not very significantly.

Table 3.34

Density of Educational Facilities in Karbi Anglong District, 2011 & 2016

(Density per 100 sq. km)

Name of CD Blocks	Area in Sq. Km.	Primary Schools		Middle Schools		High Schools		Higher Secondary Schools		Degree Colleges & other Higher Educational Instituions	
		2011	2016	2011	2016	2011	2016	2011	2016	2011	2016
Amri	167.57	66.84	83.55	17.31	8.36	7.76	2.39	1.19	0.60	0	0
Bokajan	165.33	114.32	137.30	22.38	27.22	4.23	10.89	0.61	3.02	0	1.82
Chinthong	179.04	69.26	101.10	11.73	15.64	2.79	5.59	0	1.12	0.56	0.56
Howraghat	160.91	172.15	133.62	43.50	33.56	9.32	10.57	0	3.11	0	0.62
Lumbajong	237.22	70.40	100.75	18.13	16.86	5.48	6.75	0.84	2.53	0	3.79
Nilip	248.24	68.89	62.04	7.65	8.06	2.01	2.82	0	0.81	0	0.40
Rongkhang	333.36	76.19	75.29	43.20	15.30	8.70	4.50	1.80	1.20	0.30	0.90
Rongmongwe	128.64	77.74	97.95	3.89	12.44	0.78	6.22	0	0	0	0
Samelangso	181.47	105.25	89.27	13.23	09.92	3.86	3.86	1.10	0.55	0.55	0.55
Socheng	112.91	59.34	130.19	8.86	42.51	0.89	8.86	0	0.89	0	0
Langsomepi	96.28	166.18	140.22	8.31	22.85	1.04	6.23	0	1.04	0	1.04
CD Block District	**2010.97 10434.00**	**9 0.11**	**98.31**	**20.39**	**17.70**	**4.82**	**5.87**	**0.65**	**1.39**	**0.15**	**1.00**

Source: Researcher's Personal computation based on District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam and Axom Sarba Shiksha Abhijan Mission, Diphu, Karbi Anglong (2016)

On the other, the overall **Health facilities** in the district are insignificant in number. According to 2011, there were altogether only 3 Community Health Centre (CHCs), 23 Primary Health Centre (PHCs), 37 Primary Health Sub Centre (PHSCs), 2 Maternity and Child Welfare Centre (MCWCs), 11 State Dispensary (SDs), 12 Veterinary Hospital (VHs), 4 Family Welfare Centre FWCs), and other Non-Government medical facilities Charitable etc. in the district (**Table 3.29**). As a result, the average densities per 100 sq.km of these Health facilities were recorded very less and were found located scattered which gave unsatisfactory scenario of the distribution of health facilities in the district as a whole. It is clearly noticeable from the study that, only 0.15 CHC per 100 sq. km was recorded in 2011 **(Table 3.35).** Even in the case of other health facilities, the density of health facilities was less than 1 per 100 sq. km

except in PHCs (1.14) and PHSCs (1.84) which recorded a little more than 1 per 100 sq. km in the district as a whole. The low density of health facilities in the district may be attributed mainly because of the geographical location factors, such as undulating topographical nature, lack of transportation and communication connectivity from rural to urban and urban to rural areas, lack of willingness or unwillingness attitude of the govt. machineries to provide adequate facilities and render regular but better services for the development of such health facilities for the poor rural people. Therefore, the picture of health facilities in the entire district excepting the few urban/town areas and the areas located nearby the urban areas where every necessary facility is available, in general seems very unsatisfactory. To overcome such problems, the local authority has to therefore undertake certain measures by/through which health facilities in the district can be improved and regular but better health care services can be rendered to the people especially to rural poor people living in the remote areas. But in case of health related data/figure for 2016**,** the block-wise analysis has been shown only 8 CDBs instead of the total 11 CDBs considering the data of 2019 as the data for Langsomepi, Samelangso and Rongmongve CD Blocks are not available separately but are available as part of the data for Howraghat (includes Langsomepi and Samelangso) and Nilip (includes Rongmongve) CD Blocks. The analyses of these data have been incorporated in the next pages of the present study.

The present discussion has reflected only the general distribution and densities of the facilities/amenities according to areal units i.e. CD Blocks wise, but the location aspects of the distribution of these facilities are also equally important. Therefore, for further analysis of the facilities, the intensities of these facilities/amenities have been calculated in relation to their locations and the general distribution of those facilities have been shown by drawing the simple graphs.

Table 3.35

Density of Medical (Health) Facilities in Karbi Anglong District, 2011

(Density per 100 sq. km)

Name of CD Blocks	Area in Sq. Km.	CHC	PHC	PHSC	MCWC	SD	FWC	OTHERS
		2011	2011	2011	2011	2011	2011	2011
Amri	167.57	0.60	1.19	1.79	0	1.19	0	0.60
Bokajan	165.33	0	0.61	3.02	0	1.21	0	0.61
Chinthong	179.04	0	0.56	1.12	0	0	0	0
Howraghat	160.91	0	4.35	2.49	0	0.62	0	0
Lumbajong	237.22	0	1.27	3.37	0	1.27	0.42	0.42
Nilip	248.24	0	0	0.40	0	0	0	0
Rongkhang	333.36	0.60	0.90	2.70	0.30	0.30	0.90	0
Rongmongwe	128.64	0	0	2.33	0	0.78	0	0.78
Samelangso	181.47	0	2.20	0.55	0.55	0	0	2.20
Socheng	112.91	0	0	0	0	0.89	0	0
Langsomepi	96.28	0	2.08	1.04	0	0	0	1.04
CD Blocks District	**2010.97 10434.00**	**0.15**	**1.14**	**1.84**	**0.10**	**0.55**	**0.20**	**0.45**

Source: Researcher's Personal computation based on District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

4.5.1 (b) LOCATIONAL INTENSITY OF FACILITIES/AMENITIES IN KARBI ANGLONG DISTRICT

In the present study, the locational intensities of the district have been studied under the following sub heads:

4.5.1 (b) (i) Educational Facilities

According to the norms of Planning Commission, New Delhi proposed for Primary schools, the maximum walking distance from the habitation of a child should not exceed 1.5 km., within 3.0 km distance for Upper Primary/Middle schools accessibility and 4.0 km for Higher Secondary schools in the area/region. However, in places with difficult hilly terrain, risk of landslides, floods etc or habitations where no schools exists, this proposed limits may be reduced and the local govt. will make adequate arrangements for providing elementary education.

Keeping in view the Planning Commission's criteria, the district has a low density of population but high dependency ratio. In the study area, on account of lower degree of locational accessibility of educational facilities, the district requires more number of Middle schools, Secondary schools and Higher Secondary schools rather than Primary schools. In the existing conditions, there were 1812 Primary Schools located at 1745 locations/centre in the area. The locational intensity of Middle Schools was 1.35 in 2011, which has decreased to 1.08 in 2016 (**Table 3:36).** It is remarkably noticeable that during 2011 there were 410 middle schools which have decreased to 356 in 2016 **(Table 3.13).** This decreased in the average locational intensity of Middle schools in the area may be because of the up gradation of middle schools to high schools. But in case of other categories of educational facilities, the degree of average locational intensity was found to be increasing except High Schools and Degree Colleges which remained the same during the last six years of time. It can however be added here that most of the Degree Colleges in the district are located in the urban and town areas only. The block - wise locational intensity of the Degree Colleges in the district during the last 2011 to 2016 has however shown 0 (Zero) in most of the CD blocks. Similarly, locational intensity of Higher Secondary Schools in Rongmongve Block also has shown 0 (Zero) in both the year of 2011 and 2016. On the other, the degree of intensity of primary schools facility has been seen increasing from 1.04 in 2011 to 1.14 in 2016 **(Table 3.36).**

It may therefore be concluded from the above discussion that the locational intensity of these educational facilities in the study area is very low and scattered distributed. In fact, the average intensity of all these educational facilities in the district does not correspond to all the settlements available and are not satisfactorily available in the district. **Fig: 1.22 (a) & 1.22(b)**

Table 3.36

Locational Intensity of Educational Facilities in Karbi Anglong District, Assam (2011 & 2016)

Name of CD Blocks	Primary Schools						Middle Schools						High Schools						Higher Secondary Schools						Degree Colleges & Other Higher Educational Institutions					
	2011			2016			2011			2016			2011			2016			2011			2016			2011			2016		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Amri	112	104	1.08	140	120	1.17	29	23	1.26	14	14	1	13	11	1.18	4	4	1	2	2	1	1	1	1	0	0	0	0	0	0
Bokajan	189	183	1.03	227	209	1.09	37	26	1.42	45	42	1.07	7	7	1	18	18	1	1	1	1	5	4	1.25	0	0	0	3	3	1
Chinthong	124	122	1.02	181	168	1.08	21	17	1.24	28	26	1.08	5	5	1	10	10	1	0	0	0	2	2	1	1	1	1	1	1	1
Howraghat	277	275	1.01	215	193	1.11	70	56	1.25	54	50	1.08	15	15	1	17	17	1	0	0	0	5	5	1	0	0	0	1	1	1
Lumbajong	167	164	1.02	239	200	1.2	43	34	1.27	40	40	1	13	10	1.3	16	14	1.14	2	2	1	6	5	1.2	0	0	0	9	9	1
Nilip	171	171	1	154	133	1.16	19	14	1.36	20	19	1.05	5	5	1	7	6	1.17	0	0	0	2	2	1	0	0	0	1	1	1
Rongkhang	254	210	1.21	251	213	1.18	144	91	1.58	51	47	1.09	29	29	1	15	13	1.15	6	6	1	4	4	1	1	1	1	3	3	1
Rongmongwe	100	100	1	126	115	1.1	5	5	1	16	16	1	1	1	1	8	8	1	0	0	0	0	0	0	0	0	0	0	0	0
Samelangso	191	191	1	162	144	1.13	24	24	1	18	17	1.06	7	7	1	7	6	1.17	2	2	1	1	1	1	1	1	1	1	1	1
Socheng	67	66	1.02	147	117	1.26	10	8	1.25	48	38	1.26	1	1	1	10	10	1	0	0	0	1	1	1	0	0	0	0	0	0
Langsomepi	160	159	1.01	`135	126	1.07	8	6	1.33	22	22	1	1	1	1	6	6	1	0	0	0	1	1	1	0	0	0	1	1	1
CD Block District	**1812**	**1745**	**1.04**	**1977**	**1738**	**1.14**	**410**	**304**	**1.35**	**356**	**331**	**1.08**	**97**	**92**	**1.05**	**118**	**112**	**1.05**	**13**	**13**	**1**	**28**	**26**	**1.08**	**3**	**3**	**1**	**20**	**20**	**1**

Source: Author's Personal computation based on District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam and Axom Sarba Siksha Abhiyan,Diphu, Karbi Anglong (2016)

N.B : 1 = Total Number of facilities
2 = Villages having facilities
3 = Intensity of the facilities/functions

Locational Intensity of Educational Facilities in Karbi Anglong District (2011 & 2016)

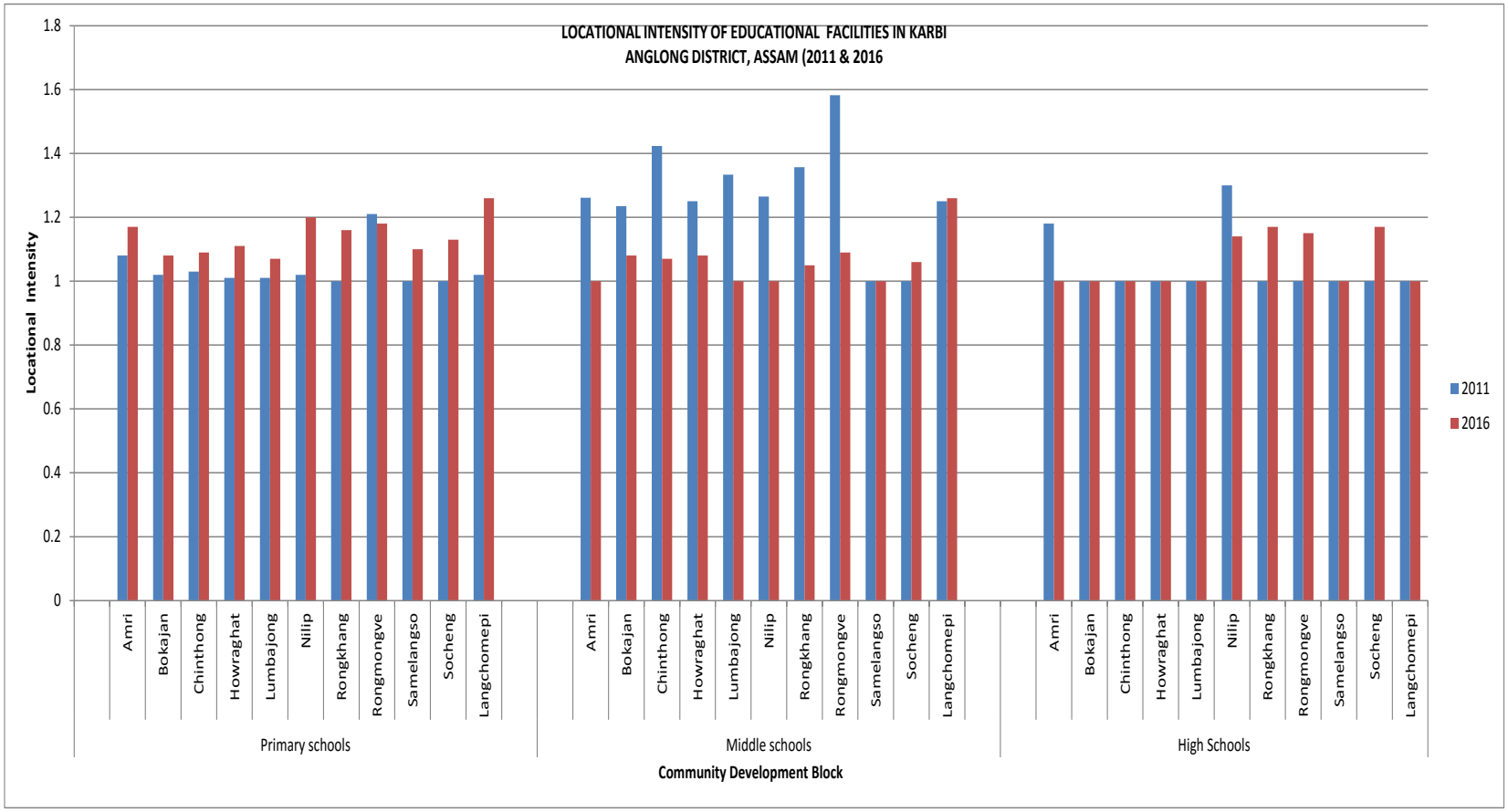


Fig: 1.22 (a)

Locational Intensity of Educational Facilities in Karbi Anglong District (2011 & 2016)

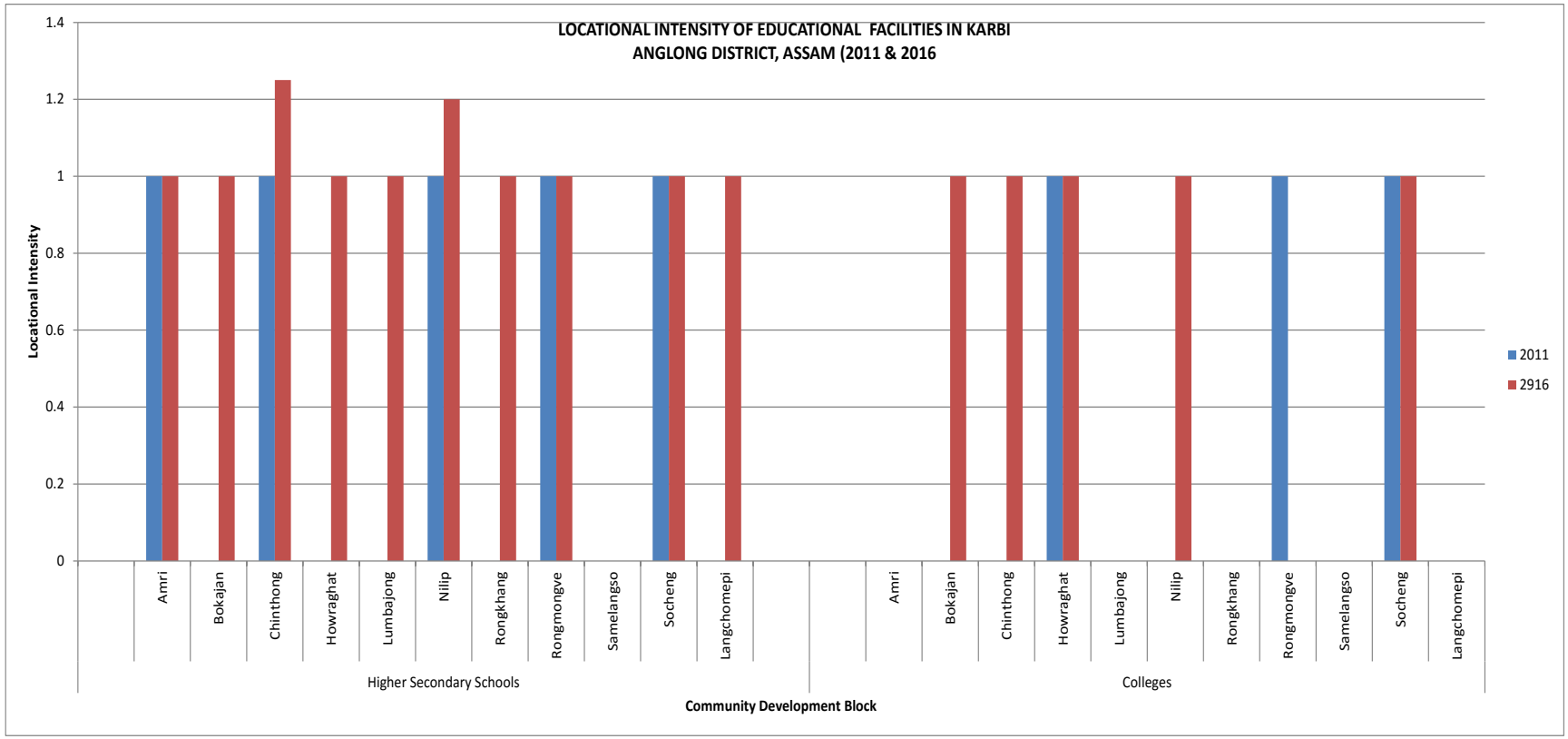


Fig: 1.22 (b)

4.5.1 (b) (ii) Health (Medical) Facilities

Health is a state of complete physical and mental fitness. It is an important aspect of the social development of any region. Although, Medical or Health is considered one of the most important indicators to measure the state of social and economic well-being of an area or a region, in the existing conditions, the health facilities in the present study area within the administrative set up of health facilities or services so far are less in number. These facilities/services are mostly located and confined to the urban and town areas only. Here in the study area, in fact, the existing number of health facilities does not correspond at all to the number of settlements of the district. It has also been seen that, the district has long time been lacking in health facilities along with other important facilities that are needed for the population of the district. It is therefore necessary to explain the distribution of the existing health centre/facilities in relation to the location of the settlements and population density in the following manner**.**

In the District, under the study of medical/health facilities includes mainly Community Health Centres (CHCs), Primary Health Centres (PHCs), Mini Primary Health Centres (MPHCs), Primary Health Sub Centres (PHSCs), Maternity and Child Welfare Centres (MCWCs), State Dispensaries (SDs), Family Welfare Centres (FWCs), and Others which include Veterinary Hospitals and Non-government medical facilities charitable etc. **(Table 3.29).** It is observed that, in the existing conditions, there were 3 CHCs, 23 PHCs, 37 PHSCs, 2 MCWCs, 11 SDs, 4 FWCs and 9 others in the area. But in absolute terms, all these facilities have been seen unevenly distributed across the region. Block-wise study of locational intensities for 2011 further reveals that, most of the CD Blocks are either not covered or have zero coverage by these above mentioned health facilities. Amongst the CD Blocks, so far as the Locational Intensity of health facilities are concerned, the highest numbers of facilities have been observed in Rongkhang CD Block, while the least figure of facilities have been seen in Nilip CD Block followed by Socheng CD Block **(Table 3.37).** Samelangso CD Block however has recorded the highest locational intensity i.e. 1.33 particularly in PHSCs amongst the CD Blocks in the entire district. The locational intensities in all other health facilities recorded as 1.0 further indicates that one location has one facility only while 0 indicate no facilities. But in case of health related data/figure for 2016, the block-wise analysis has been shown for 8 CD Blocks instead of the total 11 CD Blocks considering the data of 2019 as the data

for Langsomepi, Samelangso and Rongmongve CD Blocks are not available separately but are available as part of the data for Howraghat (includes Langsomepi and Samelangso) and Nilip (includes Rongmongve) CD Blocks. Thus, altogether, the block-wise analysis shows 8 CD Blocks instead of the total 11 CD Blocks. Detailed analyses of these data of Health Care Services in Karbi Anglong District have been incorporated and explained separately in the next pages of the present study.

Table 3.37

Locational Intensity of Medical (Health) Facilities in Karbi Anglong District, Assam (2011)

Name of CD Blocks	CHC			PHC			PHSC			MCWC			SD			FWC			OTHERS		
	2011			2011			2011			2011			2011			2011			2011		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Amri	1	1	1.0	2	2	1.0	3	3	1.0	0	0	0	2	2	1.0	0	0	0	1	1	1.0
Bokajan	0	0	0	1	1	1.0	5	5	1.0	0	0	0	2	2	1.0	0	0	0	1	1	1.0
Chinthong	0	0	0	1	1	1.0	2	2	1.0	0	0	0	0	0	0	0	0	0	0	0	0
Howraghat	0	0	0	7	7	1.0	4	4	1.0	0	0	0	1	1	1.0	0	0	0	0	0	0
Lumbajong	0	0	0	3	3	1.0	8	8	1.0	0	0	0	3	3	1.0	1	1	1.0	1	1	1.0
Nilip	0	0	0	0	0	0	1	1	1.0	0	0	0	0	0	0	0	0	0	0	0	0
Rongkhang	2	2	1.0	3	3	1.0	9	9	1.0	1	1	1.0	1	1	1.0	3	3	1.0	0	0	0
Rongmongwe	0	0	0	0	0	0	3	3	1.0	0	0	0	1	1	1.0	0	0	0	1	1	1.0
Samelangso	0	0	0	4	3	1.33	1	1	1.0	1	1	1.0	0	0	0	0	0	0	4	4	1.0
Socheng	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1.0	0	0	0	0	0	0
Langsomepi	0	0	0	2	2	1.0	1	1	1.0	0	0	0	0	0	0	0	0	0	1	1	1.0
CD Block	**3**	**3**	**1.0**	**23**	**22**	**1.05**	**37**	**37**	**1.0**	**2**	**2**	**1.0**	**11**	**11**	**1.0**	**4**	**4**	**1.0**	**9**	**9**	**1.0**
District																					

Source: Author's Personal computation based on District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

N.B : 1 = Total Number of facilities

2 = Villages having facilities

3 = Intensity of the facilities/functions

KARBI ANGLONG DISTRICT
LOCATIONS OF GOVERNMENT AND PRIVATE HOSPITALS

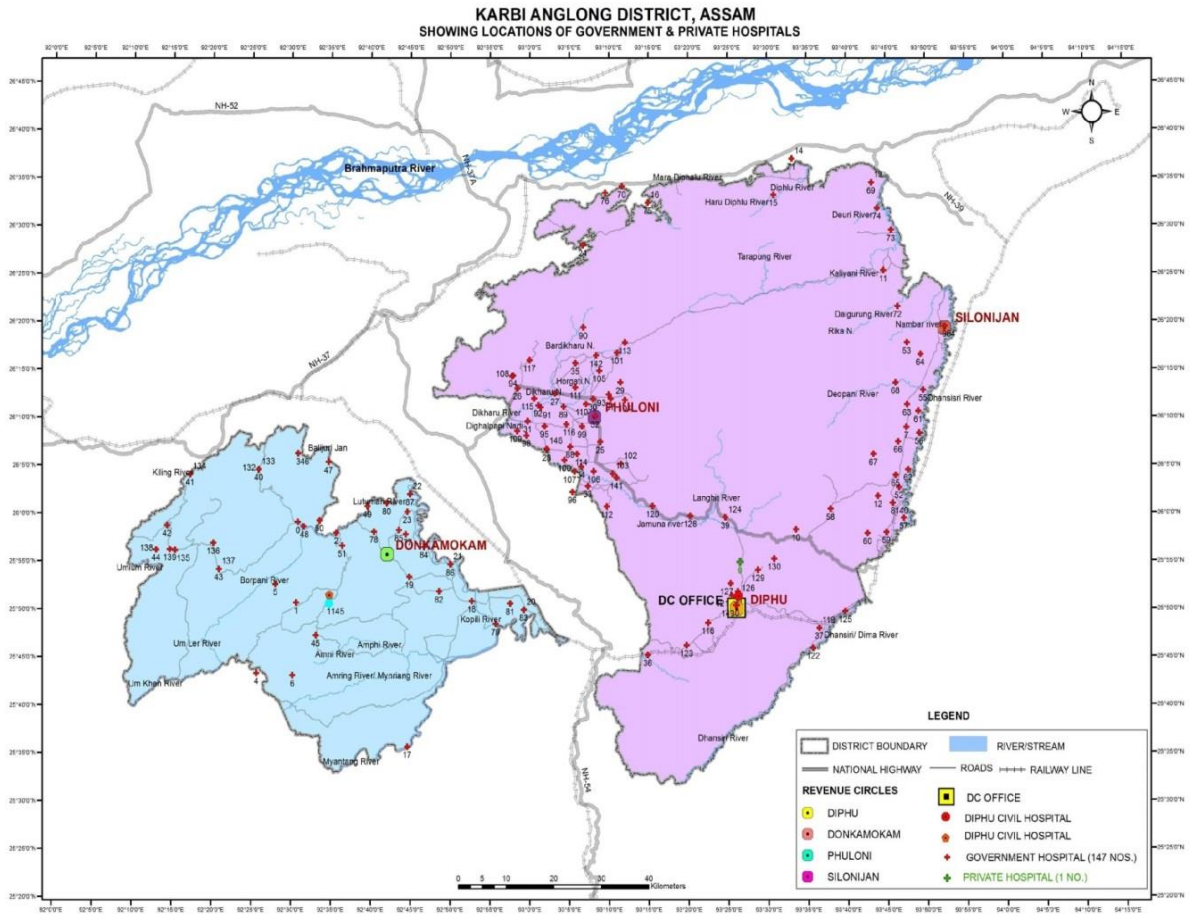


Fig: 1.15(a)

Source: Survey of India

4.5.2 HEALTH (CARE) SERVICES IN KARBI ANGLONG DISTRICT

Health care services encompass both physical and human resources. Health institutions, health workforce, doctors and beds are some of the very basic forms of health services. Health is often referred to as the condition of being sound in body and mind. It is an important aspect of the social development of any region. It is considered one of the most important indicators to measure the state of social and economic well-being of an area or a region. In the existing conditions, however, the health care facilities/ services within the administrative set up of health services so far are less in number. These facilities/services are mostly concentrated in some few areas of the region and are confined to the areas nearness to the urban and town areas only. Here in the present study area, in fact, the existing number of health facilities/ services does not correspond to the number of settlements of the district. As a result, it is seen that, there

are also disparities in the services of health in the district. It has also been seen that, the district has long time been lacking in health facilities/ services along with other important facilities/ services that are needed for the population of the district. It is therefore necessary to explain the distribution of the existing health facilities/services in relation to the location of the settlements and population density in the following manner**.**

The World Health Organization (WHO) defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity "(World Health Organization, 2014, p.1)[38.] It is also the ability of an individual to physically and mentally interact with his or her environment. It was during the **Ottawa** Charter for Health Promotion in 1986, the WHO states that health:" a resource for everyday life, not the objective of living; it is a positive concept, emphasizing social and personal resources, as well as physical capacities, which means that health is a resource to support an individual's function in wider society, rather than an end itself." (World Health Organization,1986)[39]. Further, the Millennium Development Goals (MDGs) for the year 2015 and the Sustainable Development Goals (SDGs) for the year 2030 stress the importance of good health and the availability and accessibility of health care systems (World Health Organization, 1986)[40]. In the meantime, the United Nations Development Programme (UNDP) states that at least 400 million people around the world lack basic health care facilities and more than 1.6 billion people live in fragile setting where the population is acutely vulnerable to death, disease and disruption of livelihoods (United Nations Development Programme, n.d)[41].

In India according to the National Health Profile 2018, public expenditure on health was only 1.02% of the GDP during 2015-2016 (Central Bureau of Health Intelligence, 2014, p. xv) [42]. As per an article published in PRS Blog in 2018, 70% of the total health expenditure is borne as out- of- pocket spending by the individual leading to about 7% of the population being pushed below poverty–line every year (Rao, 2018, para 9-11) [43]. Furthermore, it states that, India is short of approximately 5,00,000 doctors and has about 1 doctor for 2000 patients against the WHO recommendation of 1:1000 doctor-population ratio (Aggarwal, 2019, para.8)[44.] In case of Government allopathic doctors, the doctor-population is even higher with one government allopathic doctor attending 11,000 patients (Phanse, 2019)[45]

The availability and accessibility of good health care services in any area or region is, thus, the core of any health care system. WHO defines a health system to "consists of all organizations, people and actions whose primary intent is to promote, restore or maintain health" (World Health Organization, 2007, p.2) [46]. It includes "trained and motivated health workers, a well-maintained infrastructure, and a reliable supply of medicines and technologies, backed by adequate funding, strong health plans and evidence-based policies" (World Health Organization, n.d., para.2)[47]. However, the overall health experiences, including health systems and their availability and accessibility, are the result of the interaction between people and their physical and social environments. Human and environment interaction is one of the core themes of geography and as such concepts like space, location and place are considered to understand carious physical and human phenomena including the patterns and the causes related to health within the wider social, cultural, economic and political contexts (Dummer, 2008)[48].

The District Gazetteer for the United Mikir and North Cachar Hills (UM & NCH) districts published in 1979 much after the district was bifurcated in 1970 states that the Christian Missionaries had first introduced the western system of medicine in the district in the early part of the 20th century. Apart from this, no further information regarding the genesis of western medical facilities is available in the Gazetteer. However, during the course of field work (data collection) done for the study, it was found (Inspection Book Mohongdijua Dispensary from 1930) that a dispensary was established in **Mohongdijua (in present Lumbajong Block) way back on 1st May, 1930** under the jurisdiction of SDMO, Golaghat Sub-division of Sibsagar district[49]. The Dispensary is presently located at Mohongdijua under Manja BPHC in Lumbajong CD Block of Karbi Anglong District. The records in the dispensary reveal that it has treated number of patients with Malaria, eye disease (conjunctivitis and blepharitis), ulcers, skin diseases, diarrhea, dyspepsia, goiter, injuries and yaws, kala azar and leprosy cases were also reported in the neighbor ing places. The records also further reveal that the patients were mostly Mikirs (Karbis) and Kacharis (Dimasas). Incidentally, the Governor of Colonial Assam, Sir Robert Neil Reid, visited the dispensary on 29th October, 1940.

At present, there are altogether 11 Community Development Blocks (CDBs) in the district, 04 of them are located in West Karbi Anglong, namely—Amri, Chinthong,

Rongkhang, and Socheng CD Blocks while the rest, i.e. Lumbajong, Howraghat, Langsomepi, Samelangso, Rongmongve, Nilip and Bokajan CD Blocks are in East Karbi Anglong.

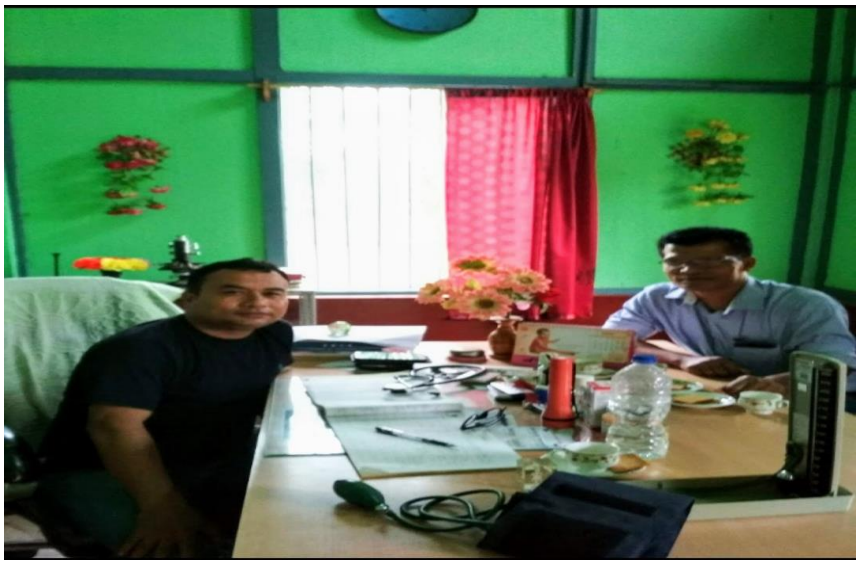
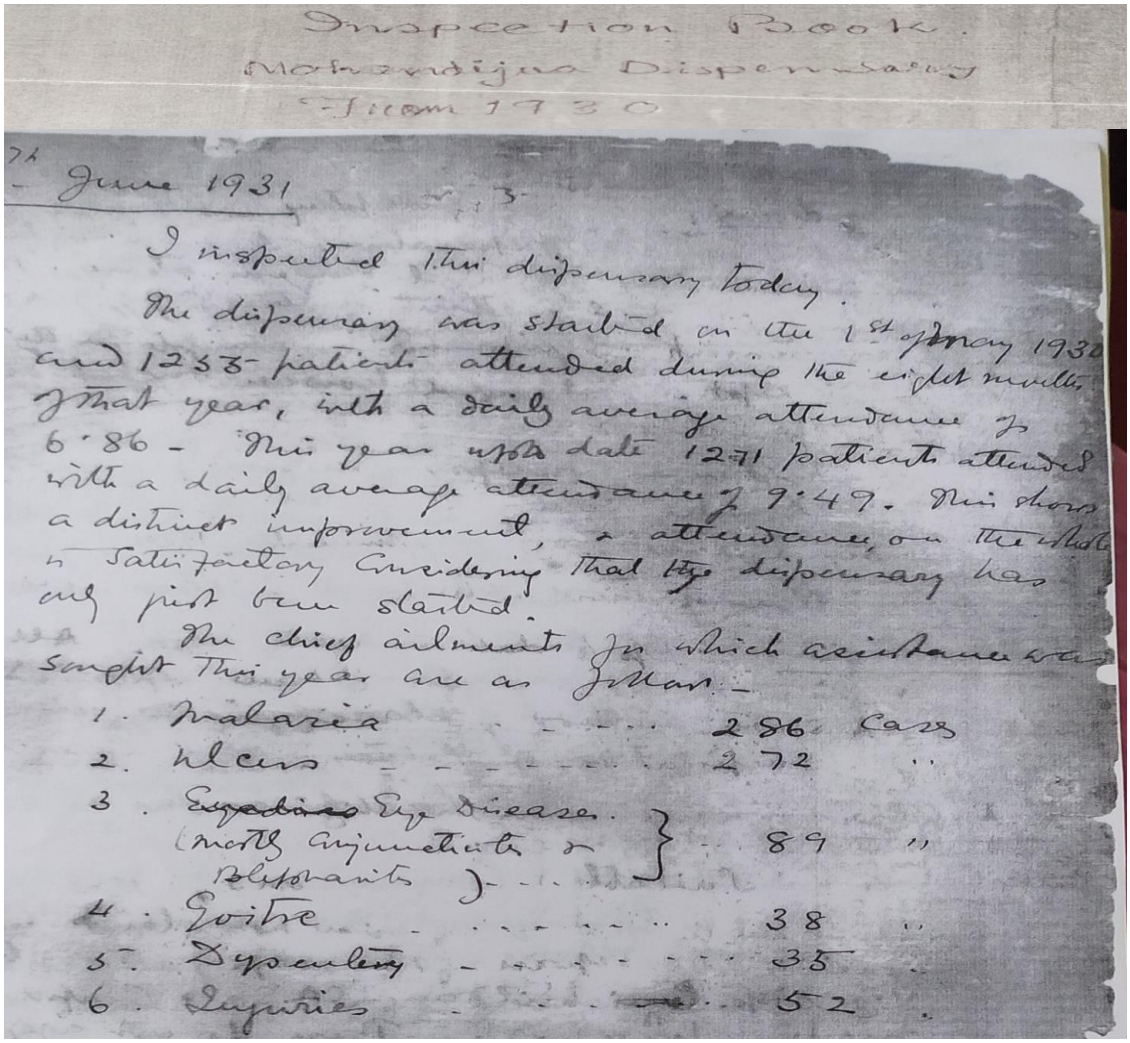


Plate no.19
Interaction with Doctor during Field Survey (Mohongdijua SHC)


Inspection Book.
Mahrendijua Dispensary
From 1930
June 1931
I inspected this dispensary today.
The dispensary was started on the 1st January 1930 and 1253 patients attended during the eight months of that year, with a daily average attendance of 6·86 - This year upto date 1271 patients attended with a daily average attendance of 9·49. This shows a distinct improvement, & attendance on the whole is satisfactory considering that the dispensary has only just been started.
The chief ailments for which assistance was sought this year are as follows:-
1. Malaria - 286 Cases
2. Ulcers - 272 "
3. Eye disease. (mostly conjunctivitis & Blepharitis) - 89 "
4. Goitre - 38 "
5. Dysentery - 35 "
6. Injuries - 52 "

Source: Reseacher's Field Work

The present study has been analyzed at the Community Development Block (CDBs) level. For the present study, health related data have been provided by the District Health Society, Karbi Anglong, National Health Mission, Government of Assam and the Office of the Joint Director of Health Services, Karbi Anglong District, and Government of Assam. The Block-wise data have been accessed from the District Census Hand Book, Karbi Anglong, Census of India, 2011, Assam. The data considered for analyses in the study on Health Institutions, Health Personnel and Doctors along with area and population are of 2011 and 2019 but the Bed-related data are of 2016. For the convenience in analyzing the health-related data, the data are available only as part of the data for 8 Blocks instead of the total 11 Blocks as the data from the Health Department have incorporated Langsomepi and Samelangso CD Blocks into Howraghat CDB and

Rongmongve into Nilip CDB. Thus, altogether, the block-wise analysis shows only 8 CD Blocks instead of the total 11 CD Blocks.

Furthermore, the data for health institutions cover Hospitals including Model Hospitals, First Referral Units (FRUs), Block Primary Health Centres (BPHCs), Community Health Centres (CHCs), State Dispensaries (SDs), Mini Primary Health Centres (MPHCs), Family Welfare Sub Centres (FWSCs) and Subsidiary Health Centres (SHCs). Similarly, the data for health personnel include data of Auxiliary Nurse Midwives (ANMs) and Staff Nurses only. In case of Beds, the data for observation beds have been omitted in the analysis.

The Study area largely comprises of hilly areas in comparison to the plain areas. Of these, Amri, Chinthong, Socheng, Samelangso, Rongmongve, Nilip and Lumbajong CDBs are located predominately in the hills. On other hand, Rongkhang, Bokajan and Langsomepi CDBs have sizeable plain areas along with the hills. In case of Howraghat CDB, the entire block is located in the plain areas. It is however, observed that, the hilly areas due to the physical conditions are sparsely populated in comparison to the plain areas. Exceptionally, Lumbajong CDB which although is a hilly area has the highest urban population in the district, the reason being due to location of its Head Quarters with a population of 61,797 (2011). Thus, two distinct groups of CDBs can be observed in Karbi Anglong district with respect to physical conditions and the population.

To carry out the study of Health (care) services in Karbi Anglong district, Block-Wise Health Institutions–Population, Health Personnel-Population, Doctors-Population, and Beds-Population ratio have been calculated for 2011 and 2019 as per the availability of the data. Similarly, Block-Wise Health Institutions-Area, Health Personnel-Area, Doctors-Area, and Beds-Area ratio has also been calculated. This Block-wise study of Health care services in the district has been further interpreted in the follow up passages with the help of drawing simple Bar diagram as well as Pie diagram wherever necessary to show the validity of the study of Health care services in the district**.** For further analysis, the annual percentage growth rate has been calculated for Health institutions, Health Personnel and Doctors.

4.5.2. (i) Block-wise Distribution of Health Institutions

Health institutions are one of the primary requisites of health services. The following given table **(Table: 3.38)** shows only 08 CDBs instead of 11 as the data from the health department has incorporated Langsomepi and Samelangso CDBs into Howraghat CDB and Rongmongve into Nilip CDB. Between 2011 and 2019, as the Table shows, the number of Health Institutions have increased in the District from 156 health institutions to 208 with Socheng block (38%) showing the highest growth followed by Chinthong block (27%). However, in absolute numbers, in 2019, Howraghat block has recorded the highest with 62 health institutions, the largest geographical area and the highest population among all the CDBs followed by Lumbajong block with 30 health institutions in the district. On the other hand, Socheng block having the coverage of smallest geographical area and the lowest population with 4 health institutions has the least number of health institutions followed by Amri block with 15 health institutions. It is therefore, apparent both for 2011 and 2019 from the **Table 3.38** as well as **Figure 1.23** that, the health institutions are not evenly distributed across the district. However, the distribution of health institutions has improved from 2011 to 2019.

Table: 3.38

Block-wise Distribution of Health Institutions in Karbi Anglong, 2011 & 2019

Name of CD Blocks	Area	Health institutions			Health institutions - area ratio (in number : sq. km		Health institutions-population ratio (in number : persons)	
		2011	2019	Annual growth rate(in%	2011	2019	2011	2019
Amri	167.57	13	15	2	1:13	1:11	1:3,506	1:3,038
Chinthong	169.04	8	25	27	1:22	1:7	1:5,819	1:1,862
Rongkhang	329.36	19	29	7	1:18	1:11	1:8,318	1:5,450
Socheng	112.91	1	4	38	**1:113**	1:28	1:27,334	1:6,834
Bokajan	162.33	24	27	2	1:7	1:6	1:6,038	1:5,367
Howraghat (include Langsomepi &Samelangso)	435.15	53	62	2	1:8	1:7	1:4,655	1:3,979
Lumbajong	220.74	26	30	2	1:9	1:8	1:3,612	1:3,130
Nilip (include Rongmongve	376.88	12	16	4	1:31	1:24	1:6,903	1:5,177
Total	**1973.98**	**156**	**208**	**4**	**1:13**	**1:10**	**1:5,422**	**1:4,067**

Source: Researcher's Personal computation based on Data supplied by District Health Society, Karbi Anglong, National Health Mission, Govt. of Assam, 2011 & 2019

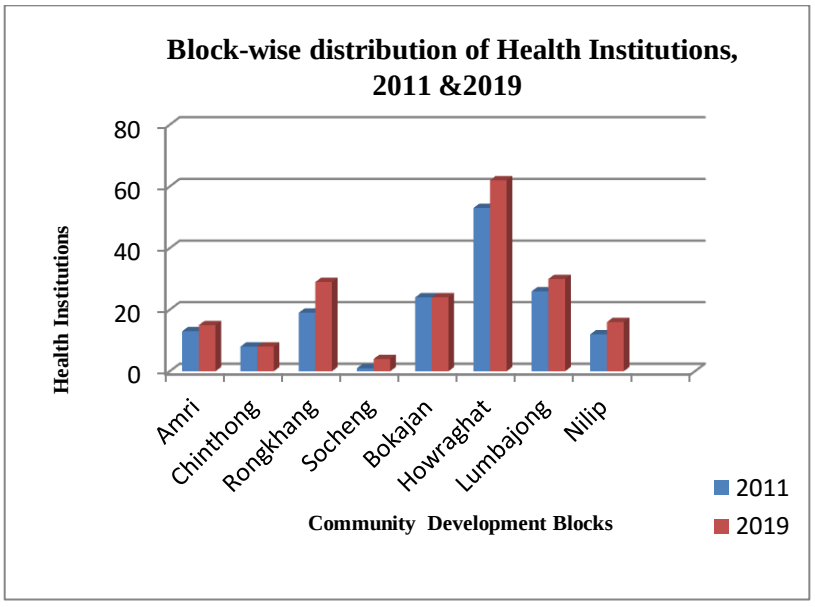


Fig: 1.23

The Health Institutions-Area ratio shows that, the area coverage of the health institutions has marginally improved from 2011(1:13) to 2019 (1:10) for the entire region. However, it is apparent that, at the block level, the situation has tremendously improved in some CDBs especially in Socheng and Chinthong CD Blocks. The other CDBs with favourable health institutions-area ratio as per 2019 are observed in Bokajan, Chinthong, Howraghat and Lumbajong CD Blocks. The Table (**Table: 3.38)** further shows that, Socheng block with 1 health institution to 28 sq.km and Nilip block with 1 health institution to 24 sq. km area are the CDBs that are required attention in this regard. The above computed table also shows that, area coverage of the health institutions (health-area ratio) even during 2011 in Socheng CD Block, there was only 1 health centre for 113 sq.km area which is the highest in comparison to other CD Blocks. As a result, a very unfavourable health-area ratio (51% in 2011 & 27% in 2019) as well as institution-population ratio was observed in both 2011 and 2019. **(**Fig**: 1.24 & 1.25)**

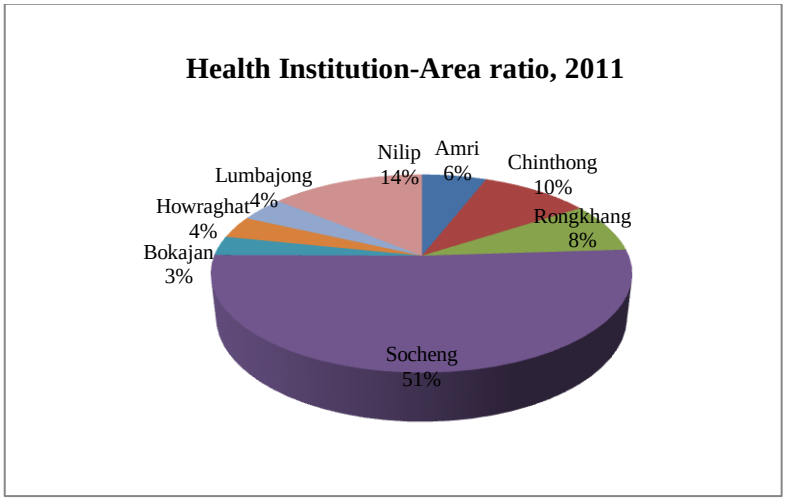


Fig: 1.24

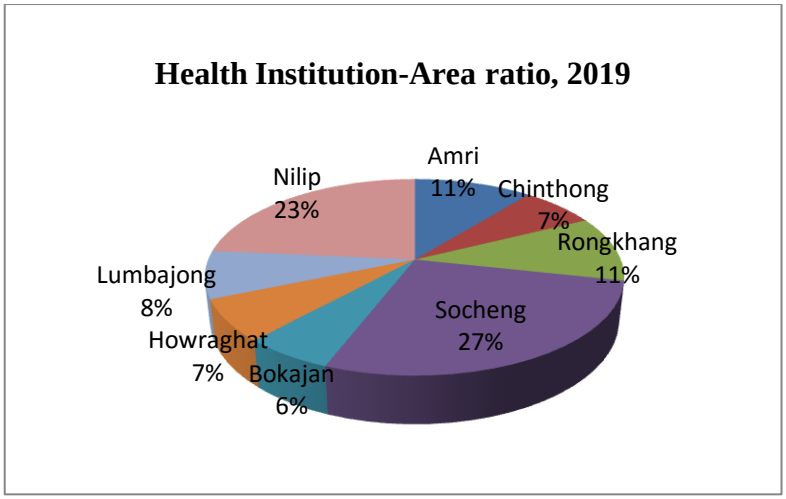


Fig: 1.25

In case of Health Institutions-Population ratio also the above computed Table and figure given below (**Table: 3.38 & Fig: 1.26)** shows that, Socheng CD Block with 1 health institution to 27,334 persons, i.e. (38%) recorded the highest ratio in comparison to Amri CD Block with 1 health institution to 3,506 persons (5%) which was the lowest as per 2011. But the situation (health institution coverage of the population) has however, improved remarkably especially for Socheng CD Block with 1 health institution to 6,834 persons, and followed by Chinthong, Ronhkhang cand Nilip CD Blocks in 2019. This remarkable improvement of the Health Institutions-Population ratio has also been further shown in percentage in **figure: 1.27.** However, in the absolute terms, it is Chinthong CD Block with 1 health institution to 2,212 persons which has the most favourable health institutions-population ratio, followed by Amri (3,038) and Howraghat (4,155) CD Blocks. On analyzing the above explanation, it is therefore observed that with a health institution-population ratio of 1:6,834, Socheng block has recorded the most unfavourable health institutions-population ratio followed by Bokajan and Rongkhang CD Blocks in the entire district. There is one Civil Hospital in Diphu (Lumbajong Block), one Sub-divisional Civil Hospital in Hamren (Chinthong Block), 5 Community Health Centres – Bakulia (Langsomepi Block), Bokajan (Bokajan Block), Howraghat (Howraghat Block), Dentaghat (Samelangso Block), and Donkamokam (Rongkhang Block) and 3 Model Hospitals -Kheroni (Rongkhang Block), Deihori (Nilip Block) and Balijuri (Rongmongve Block) in the entire Karbi Anglong district, but leaves only Amri and Socheng CD Blocks without any hospital facilities.

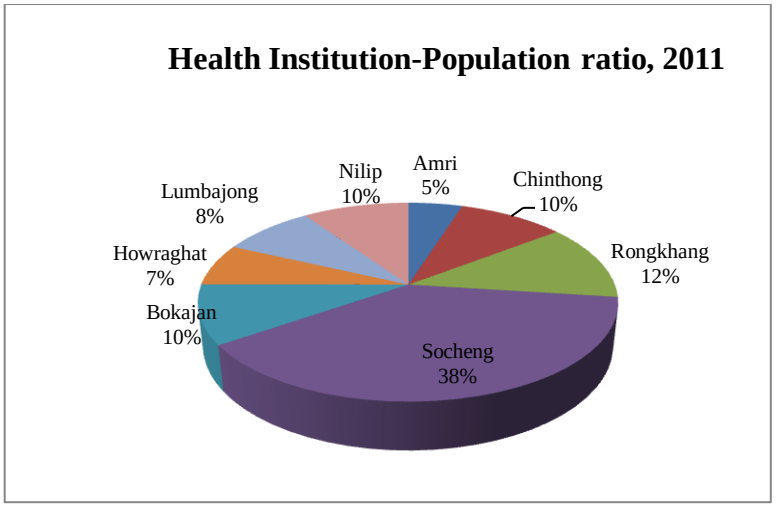


Fig: 1.26

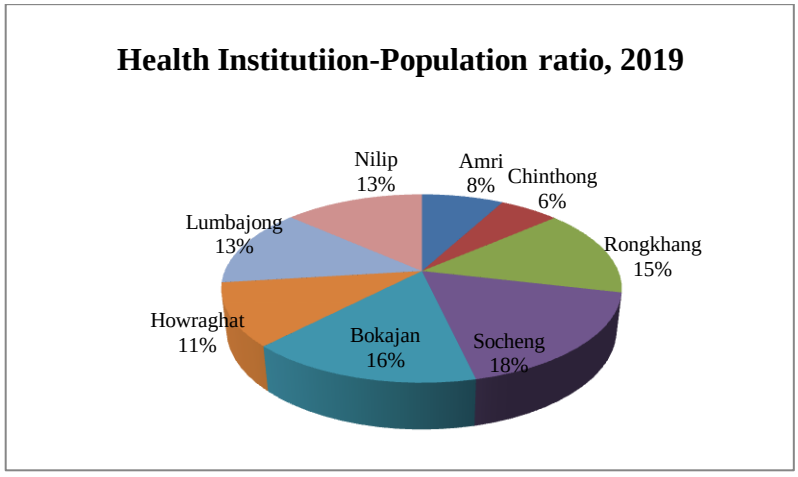


Fig: 1.27

4.5.2. (ii) Block-wise Distribution of Health Personnel

In case of the block-wise distribution of health personnel, as **Table: 3.39** shows, an increase in their number can be observed for the entire district of Karbi Anglong between 2011 and 2019. The increase have been observed from 287 health personnel in 2011 to 547 health personnel in 2019 with Socheng CD Block (56%) showing the highest growth rate followed by Chinthong CD Block (31%), while, the lowest growth rate has been recorded in Bokajan (8%) and Howraghat (8%) CD Block. As far as the absolute numbers are concerned, Lumbajong CD Block with 144 health personnel has the highest number in 2019, followed by Howraghat (140), Bokajan (70) and Rongkhang (64) CD Blocks. On the other hand, with 11 health personnel, Socheng has the lowest numbers of health personnel followed by Amri which has recorded 34. The data computed for health

personnel therefore shows and concludes that the distribution of health personnel is not even across the district. This Block-wise distribution of Health Personnel has also been further explained with the help of a simple bar diagram as shown in **figure: 1.28.**

Table: 3.39

Block-wise Distribution of Health Personnel, 2011 & 2019

Name of Blocks	Health Personnel			Health Personnel-area ratio (in persons: sq. km		Health personnel-population ratio (in persons)	
	2011	2019	Annual growth rate(in%)	2011	2019	2011	2019
Amri	20	34	9	1:8	1:5	1:2,279	1:1,340
Chinthong	12	42	31	1:15	1:4	1:4,608	1:1,317
Rongkhang	30	64	14	1:11	1:5	1:5,572	1:2,612
Socheng	2	11	56	1:56	1:10	1:13,667	1:2,485
Bokajan	43	70	8	1:4	1:2	1:3,832	1:2,354
Howraghat (include Langsomepi & Samelangso)	86	140	8	1:5	1:3	1:2,996	1:1,840
Lumbajong	74	144	12	1:3	1:2	1:2,104	1:1,081
Nilip (include Rongmongve)	20	42	14	1:19	1:9	1:4,142	1:1,972
Total	**287**	**547**	**11**	**1:7**	**1:4**	**1:3,332**	**1:1,748**

Source: Researcher's Personal computation based on Data supplied by District Health Society, Karbi Anglong, National Health Mission, Govt. of Assam, 2011 & 2019

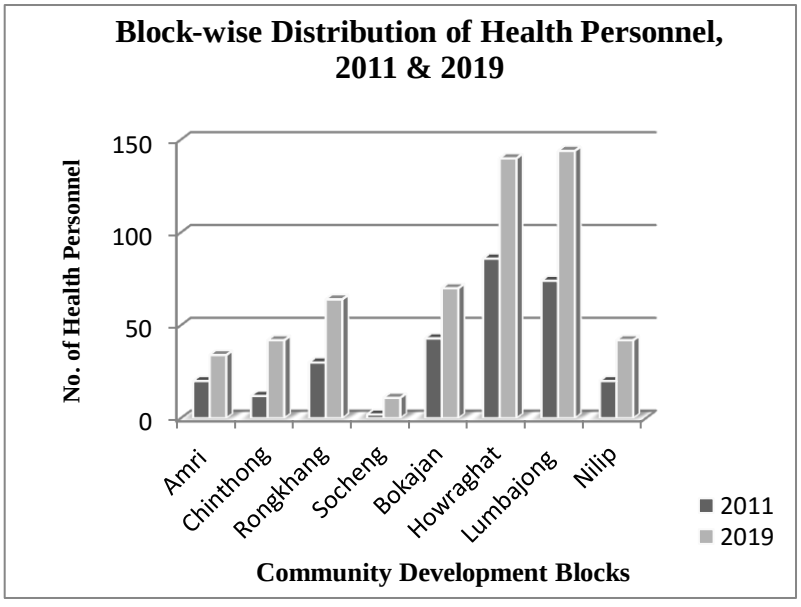


fig. 1.28

So far as Health Personnel-Area ratio is concerned, it reveals that, in comparison to 2011, the health personnel in the district are better covered in 2019. The table given above shows that, the most favourable areal coverage of health personnel can be observed in Bokajan and Lumbajong CD Blocks where 1 health personnel covers 2 sq. km area. This is followed by Howraghat CD Block where 1 health personnel covers 3 sq. km area. Contrary to it, Socheng CD Block has 1 health personnel for 10 sq, km area followed by Nilip CD Block which has 1 health personnel for 9 sq.km area. Similarly, for health personnel-population ratio, it can be seen that the situation has improved across all the CD Blocks from 2011 to 2019. Socheng CD Block has seen the most impressive improvement of all the CD Blocks from 1 health personnel against 13,667 persons in 2011 to 1 health personnel against 2,485 persons in 2019. In terms of the most favourable health personnel-population ratio, Lumbajong CD Block with a ratio of 1:1,081 stands as the most favourable health personnel-population ratio in the district. On the other hand, Rongkhan CD Block with 1 health personnel against 2,612 persons has the most unfavourable health personnel-population ratio. Furthermore, in order to show the health personnel coverage in sq.km, these Health Personnel-Area and Health Personnel-population ratio have been shown in percentage as shown in **Fig: 1.29, 1.30, 1.31 & 1.32.**

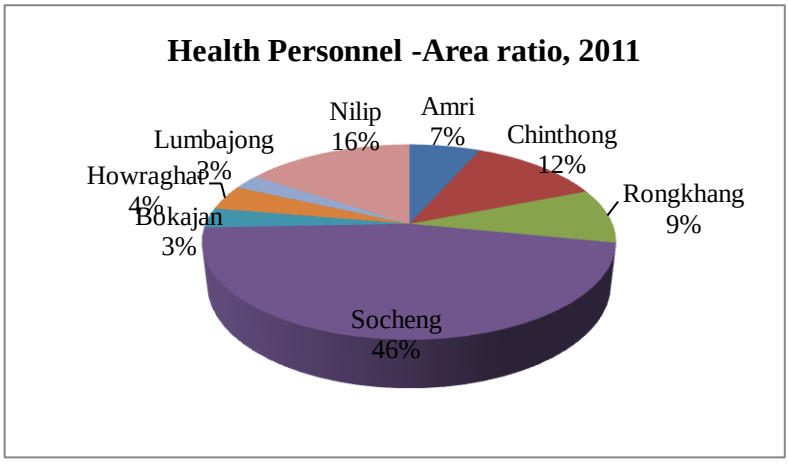
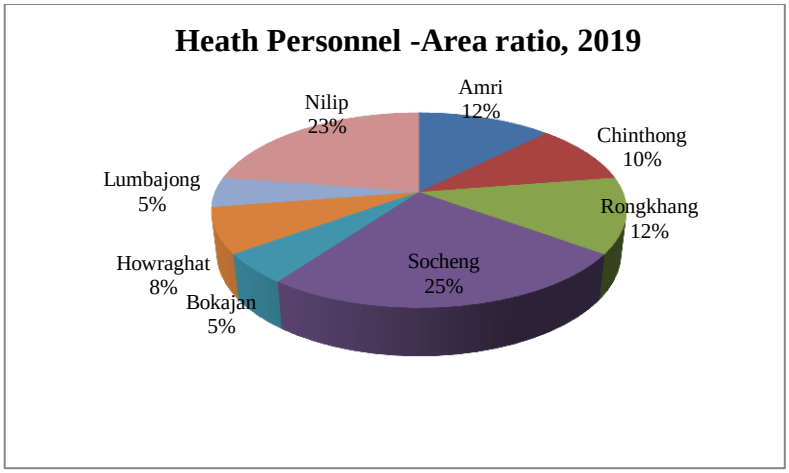


Fig: 1.29



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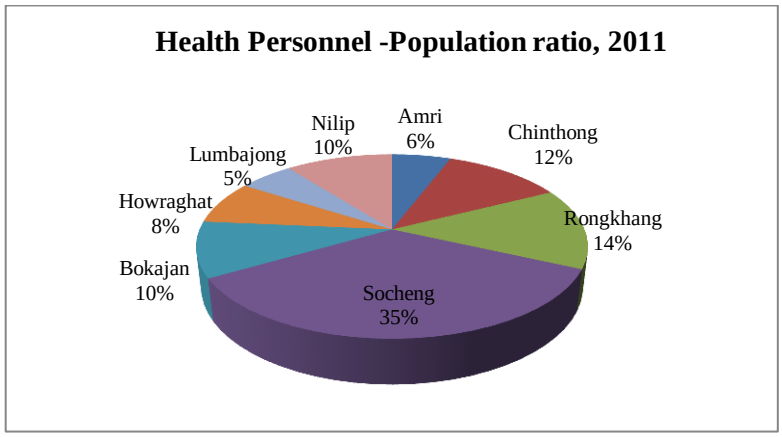


Fig: 1.31

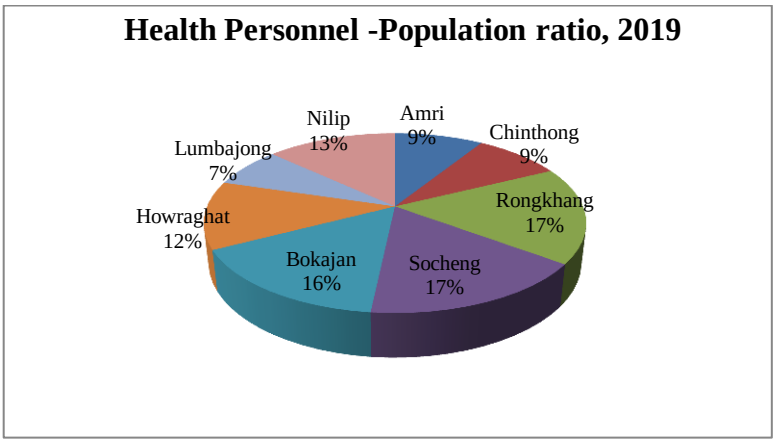


Fig: 1.32

4.5.2. (iii) Block-wise Distribution of Doctors

Doctors are one of the most important pillars of health services. As previously stated, India does not have a favourable doctor-population ratio. According to the National Health Profile (NHP) 2018, there were 1,041,395 registered Allopathic Doctors up to 2017 in the whole of India and in Assam it was 22,532**.** As per NHP, 2019 there is only one allopathic Govt. Doctor for every 10,926 people in India against the WHO's recommended doctor-population ratio of 1:1000 which means at present, an average population served by a govt. allopathic doctor is 10,926. In case of Karbi Anglong district, the total number of doctors stands at 214 as per 2019 from 47 in 2011. These figures not only include Allopathic doctors but also incorporate Homeopathic, Ayush and Dental doctors. The 2011 data in **Table: 3.40** show that most of the doctors in the region were concentrated in Lumbajong CD Block, especially in Diphu Town. The Lumbajong block recorded the highest number of 19 doctors in 2011 which has increased to 64 doctors in 2019. On the whole, the situation however, improved in 2019 with increase in the number of doctors in other CD Blocks. The increase in number of doctors were observed mainly in Chinthong CD Block saw an increase in the number of doctors from 2 in 2011 to 26 in 2019, Bokajan and Nilip CD Blocks from 3 to 20 and Howraghat block from 8 to 40 doctors. For Chinthong block, the annual growth rate was 150 percent, the highest in the district followed by Bokajan CD Block 71, Nilip Block 71 and Howraghat Block 50 percent. The district as a whole saw an increase of 44 percent doctors per annum. In absolute numbers, Lumbajong CD Block with 64 doctors has the highest numbers of doctors followed by Howraghat, Rongkhang and Chinthong CD Blocks with 40, 27 and 26 doctors respectively. Socheng CD Block with 4 doctors, on the contrary, recorded the lowest number of doctors in the entire district of Karbi Anglong. This Block-wise Distribution of Doctors in the district can also be observed from the chart as shown in Fig: **1.33**.

Table: 3.40

Block-wise Distribution of Doctors in Karbi Anglong, 2011 & 2019

Name of Blocks	Doctors			Doctors-area ratio (in persons: sq. km		Doctors-population ratio (in persons)	
	2011	2019	Annual growth rate (in percent)	2011	2019	2011	2019
Amri	4	13	28	1:42	1:13	1:11,393	1:3,506
Chinthong	2	26	150	1:90	1:7	1:27,650	1:2,127
Rongkhang	7	27	36	1:48	1:12	1:23,879	1:6,191
Socheng	1	4	38	1:113	1:28	1:27,334	1:6,834
Bokalan	3	20	71	1:55	1:8	1:54,931	1:8,240
Howraghat (include Langsomepi & Samelangso)	8	40	50	1:55	1:11	1:32,203	1:6,441
Lumbajong	19	64	30	1:12	1:4	1:8,195	1:2,433
Nilip (include Rongmongve)	3	20	71	1:126	1:19	1:27,610	1:4,142
Total	**47**	**214**	**44**	**1:43**	**1:9**	**1:20,347**	**1:4,469**

Source: Researcher's Personal computation based on Data supplied by District Health Society, Karbi Anglong, National Health Mission, Govt. of Assam, 2011 & 2019

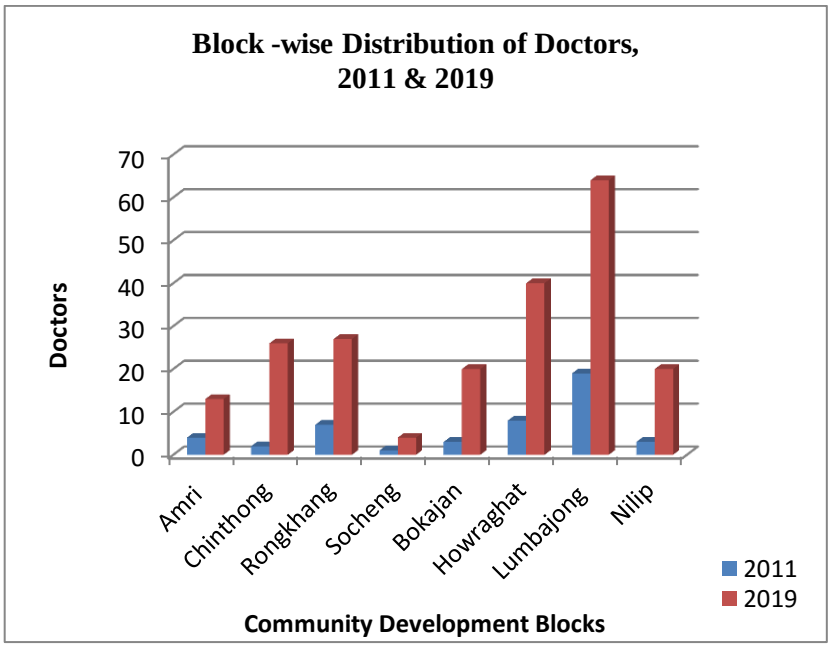


Fig: 1.33

From the computed Table (**Table: 3.38)** it is seen that, the Doctor-area ratio has greatly improved in Karbi Anglong district since 2011. Against 1 doctor covering 43 sq.

km in 2011, the 2019 figure now shows 1 doctor covering 9 sq. km only. Between 2011 and 2019, Nilip CDB has seen the most notable decrease in the doctor-area ratio from 1:126 to 1:19, followed by Socheng CDB and Chinthong CDB where the ratio has come down from 1:113 to 1:28 & 1:90 to 1:7. However, it is Lumbajong CD Block with 1 doctor covering 4 sq. km has the most favourable doctor-area ratio as per 2019 followed by Chinthong (1:7) and Bokajan CD Block (1:8). On the other hand, with 1 doctor covering 28 sq. km, Socheng Block records the largest doctor-area ratio in the entire district, followed by Nilip CD Block with 1 doctor covering 19 sq. km. The most unfavourable doctor-area ratio was however observed with 1 doctor covering 126 sq. km in Nilip Block in 2011 followed by Socheng Block with 1 doctor covering 113 sq. km.

In case of doctor-population ratio, the ratio for entire Karbi Anglong district in 2011 was 1:20,347 which has come down to 1:4,469 in 2019. This figure is, however, almost four times higher than the WHO's recommended doctor-population ratio of 1 doctor against 1,000 persons. The block-wise data for Karbi Anglong district reveals that the doctor-population ratio is all above the WHO's recommended figure which shows that the district has acute shortage of doctors. The most favourable doctor-population ratio in 2019 can be observed in Chinthong Block (1:2,127) followed by Lumbajong block (1:2,433) and Amri block (1:3,506). On the other, the highest doctor-population ratio can be observed in Bokajan Block with 1 doctor for 8,240 persons followed by Socheng Block (1:6,834) and Howraghat Block (1:6,441). It can be seen that these three CD Blocks do not have enough doctors against its population, particularly in the case of Bokajan and Socheng CD Blocks; the number of doctors is very low. The following figure (**Fig: 1.35**) also explains that, in case of Doctor-area ratio, Socheng Block (27%) recorded the highest followed by Nilip Block (18%) as per 2019. The doctor-population ratio was recorded highest in Bokajan Block (21%). **(Fig: 1.37)**

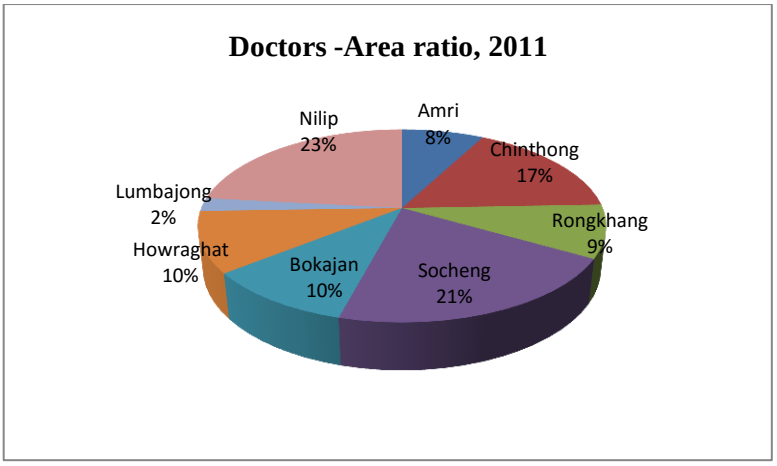
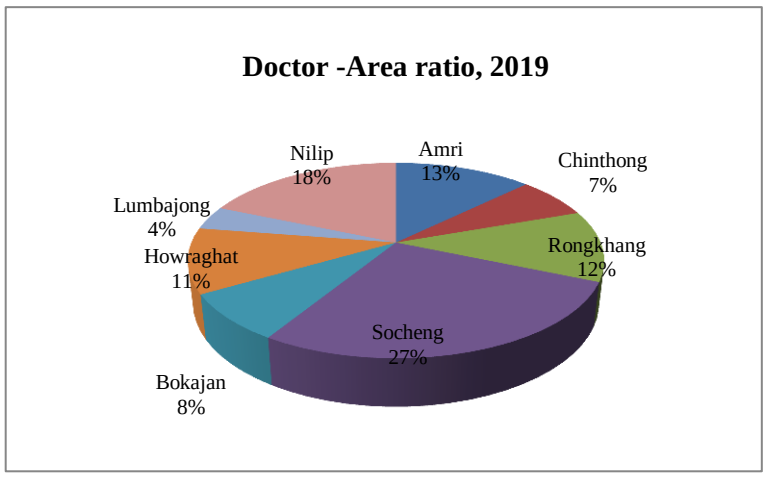


Fig: 1.34



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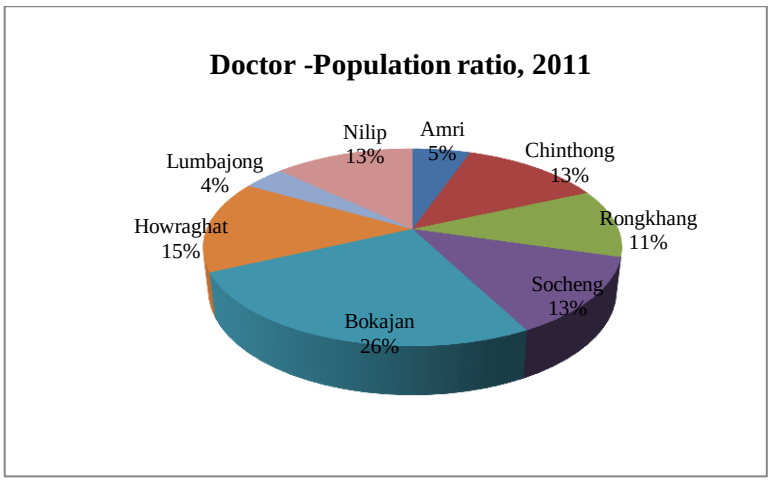

Fig: 1.36

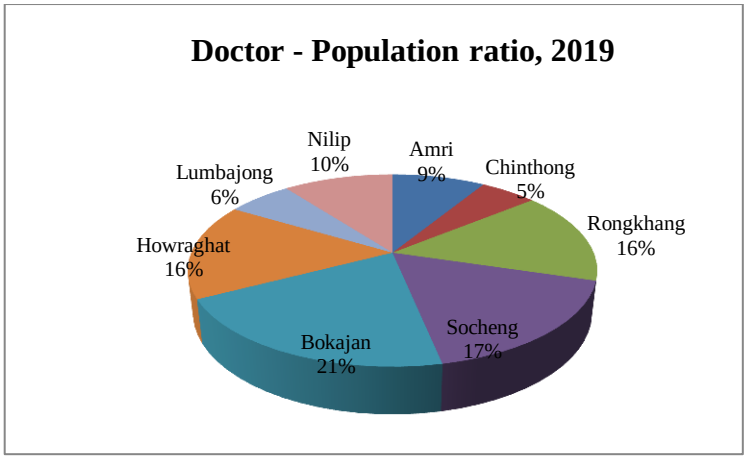

Fig: 1.37

4.5.2. (iv) Block-wise Distribution of Beds

The figures, in **Table: 3.41** show the block-wise distribution of Beds in various health centres in the District of Karbi Anglong. It may be mentioned here that the data are available for only 2016. As per the data available, Diphu Civil Hospital which is located in Lumbajong CD Block has a total of 200 Beds and Hamren Sub-Divisional Hospital which is in Chinthong CD Block has 50 Beds. Apart from these, the Community Health Centres (CHCs) in Bakulia (Langsomepi block), Bokajan, Howraghat and Dentaghat (Samelangso block) and Dongkamokam (Rongkhang block) have 30 Beds each. Similarly, the Model Hospitals in Kheroni (Rongkhang block), Deihori (Nilip block) and Balijuri (Rongmongve block) also have 30 Beds each. The BPHCs, PHCs, MPHCs and the State Dispensaries (SDs) mostly have 6 to 10 Beds. The Sub-centres, Family Welfare Sub-centres, Mini Sub-centres and Sub Health centres have one Observation Bed each. As mentioned in the foregoing pages, the Observation Beds have not been included in the calculation as well as analyses. In absolute numbers, Lumbajong block with 222 Beds has the highest number of beds followed by Howraghat Block with 132 Beds and Chinthong Block with 66 Beds. Socheng Block with 6 Beds has the lowest number of beds which is followed by Amri Block with 16 Beds and Nilip Block with 18 Beds. The entire district of Karbi Anglong has altogether 552 Beds. Going through the computed data in **Table 3.41,** it is found that, Block wise distribution of Beds across the district is not evenly distributed but is highly dispersed.

The data for Bed-Area ratio shows that Lumbajong CD Block has the lowest ratio with 1 Bed covering 1 sq.km followed by Chinthong, Bokajan ratio with 1 Bed

covering 1 sq.km followed by Chinthong, Bokajan and Howraghat CD Blocks with 1 Bed covering 3 sq. km. On the other hand, Nilip Block with 1 Bed covering 21 sq.km has the highest Bed-ratio and is followed by Socheng Block (1:19) and Rongkhang Block (1:11). The Bed–Population ratio shows that Lumbajong Block with 1 Bed against 701 persons has the most favourable ratio, followed by Chinthong Block with 1 Bed against 838 persons. On the other hand, Rongkhang block with 1 Bed against 5,572 persons with Nilip, Socheng, Amri, Bokajan and Howraghat CD Blocks show high Bed-Population ratio.

Table: 3.41

Block-wise distribution of Beds, 2016

Name of Blocks	Beds	Beds-Arearatio (in numbers:sq. km	Beds-Population ratio(in number: persons)
	2016	2016	2016
Amri	16	1:10	1:2,848
Chinthong	66	1:3	1:838
Rongkhang	30	1:11	1:5,572
Socheng	6	1:19	1:4,556
Bokajan	62	1:3	1:2,658
Howraghat (include Langsomepi & Samelangso)	132	1:3	1:1,952
Lumbajong	222	1:1	1:701
Nilip (include Rongmongve)	18	1:21	1:4,602
Total	**552**	**1:4**	**1:1,732**

Source: Researcher's Personal computation based on Data supplied by District Health Society, Karbi Anglong, National Health Mission, Govt. of Assam, 2016

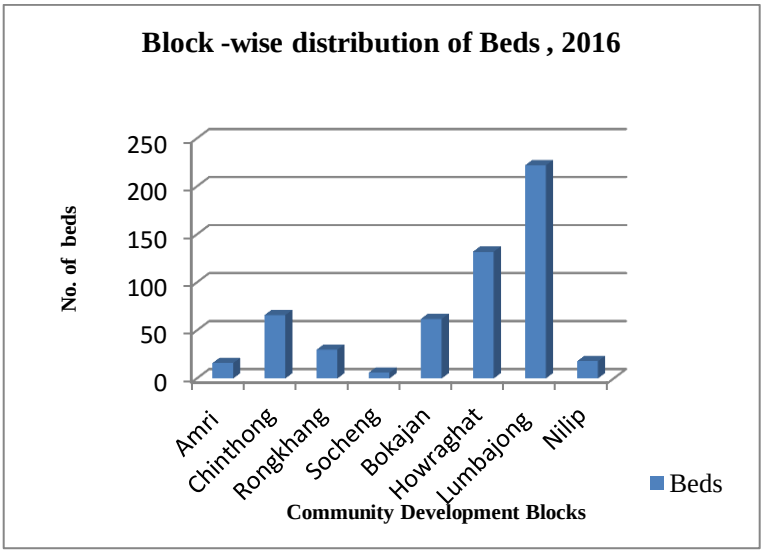

Fig: 1.38

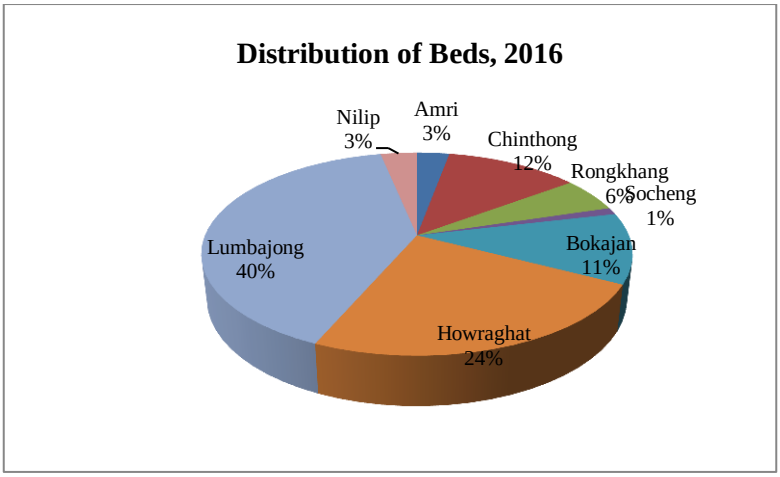

Fig: 1.39

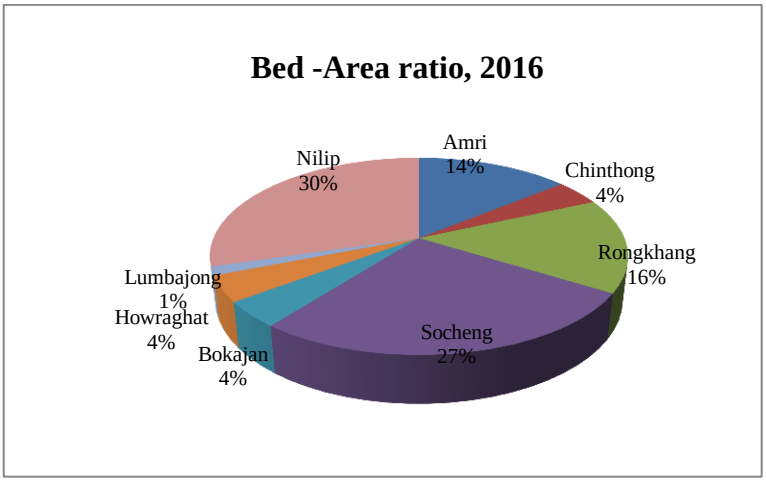

Fig: 1.40

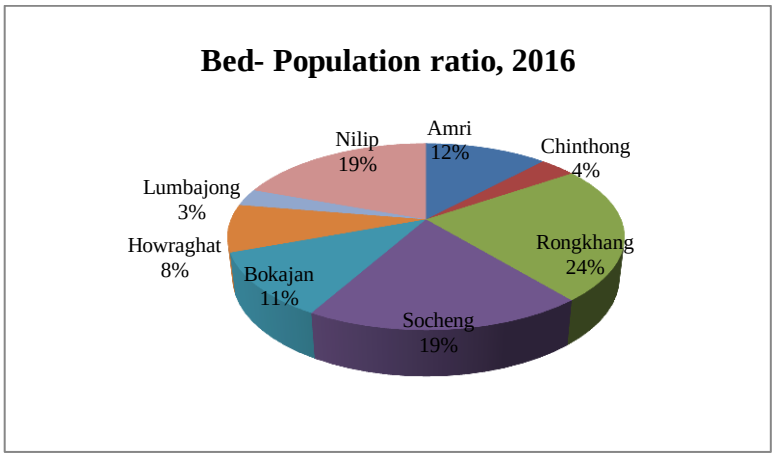

Fig: 1.41

During the course of the analysis, it was found that some of the CD Blocks were recurrently showing poor condition of health services. In terms of the availability of

Health Institutions, Health Personnel, Doctors and Beds against the area and the population of the CD Blocks, it was found that Socheng Block fared poorly in all counts. Socheng, Nilip (including Rongmongve) CD Blocks, and to some extent Rongkhang and Amri CD Blocks have allowed the need for further improvements of health services in terms of area coverage. In case of population coverage, it was found that Socheng, Rongkhang and Bokajan CD Blocks have showed that health manpower and infrastructure are not adequate for the given population. On the other hand, Chinthong and Lumbajong Blocks have showed better condition of health services. Incidentally, Hamren the Sub- divisional Headquarters of West Karbi Anglong Sub Division is located in Chinthong CD Block and Diphu the District Head Quarters of Karbi Anglong District is located in Lumbajong CD Block. Moreover, the only two Civil Hospital of the district are also located in these towns. It is likely therefore that, these factors may have contributed to better health services facility in these two CD Blocks.

Looking into the specifics of poor health services conditions in Socheng CD Block, one may refer back to **Table: 3.38 – 3.41** where it can be observed that from 2011 to 2019, there has been only marginal improvement on the health services front. The Health Institutions have increased from 1 to only 4, the number of Health Personnel from 2 to 11, the number of Doctors from 1 to 4 and only 6 Beds were reported in 2016. high scheduled tribes and rural population, low literacy rate and substantial cultivating population add another dimension to the condition of health services in Socheng Block. The other CD Blocks which have fared poorly in health services such as Rongkhang and to some extent Bokajan, Nilip and Amri CD Blocks with the exception of Bokajan Block, also share few traits such as large rural population, high ST population and low literacy rate with Socheng block. Bokajan Block, on the other hand, has low rural as well as low ST population. It has high literacy rate and high density of population. In fact, the number of Health Institutions, Health Personnel, and Doctors and Beds are not sufficient for the population size of Bokajan CD Block.

On analyzing the character of the existing health institutions, Health Personnel, and Doctors and Beds, the present study reveals that the number of Health Institutions, Health Personnel, Doctors and Beds need to be increased in Karbi Anglong District. The study also shows that there has been marginal improvement in health services in 2019 as compared to 2011. However, these facilities are concentrated in only some few CD Blocks with better health services such as Chinthong and Lumbajong Blocks, the present

study reveals that rest of the CD Blocks in Karbi Anglong District of Assam are plagued by inadequate health infrastructure and manpower. However, on closer look, it was found that these disadvantaged CD Blocks do not have similar physical and human conditions. In fact, CD Blocks such as Bokajan, Howraghat and Rongkhang blocks which are located in plain areas and possess high density of population have better health facilities than the other groups of CD Blocks. It was observed that although they had decent infrastructure and manpower compared to the other group of CD Blocks, such facilities were inadequate for them given their larger population size. Whereas in the case of CD Blocks such as Amri, Socheng, Samelangso, Rongmongve, Nilip and Langsomepi, it was observed that these CD Blocks not only have high rural population (in some cases 100 percent rural population) and high ST population but are all located in predominantly hilly areas, have low density of population and low literacy rate. More than anything else, the study reveals that the distribution of heath care facilities/ services in the study area is a reflection of the physical and human condition. An in-depth study incorporating these factors would surely bring out the nuances of the interaction between physical and human factors in understanding the distribution of healthcare facilities of Karbi Anglong in particular and Assam in general. It has been observed that such understanding has rarely made it to the planning and decision-making processes in the region. The incorporation of which will go a long way in improving the quality and the reach of healthcare services in the region.

To carry out the study further, altogether a total of 22 Educational institutions, 34 Health (Medical) institutions and 24 Villages covering almost all the 11 CD Blocks were surveyed using simple questionnaires (**Appendix-III**). During the course of survey, all the primary data sources had been collected by the researcher randomly by visiting office to office, institutions to institutions and village using Questionnaires.

Plate: 17 **Plate: 18**

Interaction with the Village Head man during Field Survey
(Hori Taro & No. 2 Joypur Village)

Plate: 22
Visit to Office of the Deputy Director of Economic and Statistics,
Karbi Anglong, Diphu

During the Primary survey (Field survey), it was found that, educational institutions in rural areas are mostly found to be accompanied by higher teacher-students ratio, poor communication connectivity, poor infrastructure facilities and higher rate of school dropout, located in the remote areas and problem of supply of pure drinking water facilities absence of retaining boundary walls etc.

At the same time, it was also found that, there is a problem of drinking water facilities; lack of infrastructural facilities and inadequate workforce in most of the health sub centres in the district.

Further, it was also observed that, out of the total of 34 health centres surveyed, most of the health centres are rural in nature except CHC, BPHCs and MPHCs and are located in the rural areas at a distance of about 283 km (Umswai SC) from the Head Quarters (**Appendix-III**). The numbers of villages covered by these health centres are found to be maximum of 100 villages in Choukihola BPHC (Nilip CD Block) and Donkamokam CHC with 187 villages (Rongkhang CD Block).

In case of the 22 numbers of educational institutions surveyed covering almost all the CD Blocks, all the institutions barring a few have showed Arts streams as their course of study in the institution. No science streams were found during the survey.

However, out of the 24 villages surveyed, Karbi tribes are found to be major and dominant tribes/ inhabitants in almost all the villages surveyed. During the course of survey, it was observed that most of the family living in the villages is economically poor and daily wage laborers. Many villages surveyed are even found to be located at a distance of 20 to 40 km away from the main towns and are deprived of even getting minimum facilities that are available.

It is therefore observed from the, data of (**Appendix-III**) Primary Survey (Field survey) that, the village located in remote areas is deprived of getting better facilities as compared to those villages which are located near the urban location. Even the distributions of infrastructure facilities in these institutions/centres are of dispersed in nature.

In most of the educational institutions and health centres surveyed, it is observed that, there are inadequate educational and health infrastructure and workforce. Therefore, there is an urgent need to check the infrastructural facilities available not only in these educational institutions and health centres but in all the educational institutions and health centres by the concerned authorities and provide the infrastructure facilities that are required for the proper functioning of the institutions in the entire district.

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CHAPTER – V

SPATIO-FUNCTIONAL PATTERN

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SPATIO-FUNCTIONAL PATTERN

In the preceding chapter, the locational patterns and the spatial distribution of each and every Education and Health facilities have been described in relation to its various aspects. It refers to the analytical aspects of education and health facilities available in the district and these facilities would give the better base to choose the strategic centre/nodal points for balanced development and future growth of the functional facilities in the area. The centre/nodal points in this context are defined by the major facilities available in the centres. Usually, the importance of a place is defined by its population as well as functional size. To understand the spatio-functional pattern in the study area, the concept of Population Threshold indices has been followed. Further, identification of the centres and their inter-relationships among the availability of facilities has also been worked out here in the study. The centrality pattern and functional hierarchy is considered important in the study for detailed analysis.

In the classical central place theory, centrality is defined as the functional importance of a settlement over the other settlements surrounding the centres. According to Christaller (1933)[1], one of the key aspects of the theoretical formulations brought in the sharp focus by central place theory is the regularities of distribution and hierarchical arrangements of functions in a region. The classical theory of central places has however failed to explain the real conditions of the distribution of centrality patterns.

Centrality as such, therefore, is the collective attractive power of all the central functions present on a centre. The measurement of centrality, therefore, implies a conscious consideration of the central functions. There is in fact no full proof method of selecting the variables for studying centrality. Selection of central functions from a wide range of services and activities assumes critical importance, as difficult to assess the relative role of individual function to the centrality of a settlement.

Considering the characteristics of the nodal points/centres of the study area, the main attention in this chapter is focused:

i) To identify the nodal points .i.e. called centres of the area;

ii) To find out the composite picture of facilities available on these centres, and finally,

iii) To analyze the salient features of the centrality patterns in order to understand and describe spatio-functional patterns/facilities, so that the strategic nodal centres of the area may be identified.

In fact, once the functions are recognized and selected, the task involves is to rank them objectively in relation to their importance and from the standpoint of contribution to the centrality of the places or centres in which these facilities are located. In fact, functions are not ubiquitous in nature. For the detailed their relative study, we will have therefore to select some of the important centres as their locations and explain the various facilities available in the district in relation to its different aspects.

5.1 METHODS

A good number of studies conducted on central place systems of various regions have used different centrality indices suiting their own purpose and scope of investigations. The question therefore, arises their closeness with the meaning ascribed to the concept of centrality. Centrality is defined as the functional importance of a settlement over others surrounding it. There are however, no standard formulas for measuring the centrality or the functional importance of the settlements or the central places. Even, Christaller's measure of importance which is based on telephone calls and weighted by telephone densities was not based upon purely objective method of ranking. Berry and Garrison (1958)[2] correlated settlement population with number of occurrences of the activities and used the estimating equation to compute the size and which occurrence should be formed .The rank of an activity was defined at its entry points in terms of population. Berry and Barnum (1962) [3] applied the factor analysis and indices matrix of activities and places and ranked the activities of their scores on the component for identifying the continuum of activities. In India too, Datta and Banarjee (1970) [4] have computed a composite index of transportation development which has been equated as conforming to the hierarchy of central places in West Bengal. Singh (1968) [5] on the other hand, has considered the number of persons engaged in secondary and tertiary activities to work out the relative and absolute centrality indices.

Keeping in view all the above methods as well as centrality indices, the first and foremost step in the present study requires consideration and adoption of a suitable and objective method for ranking centrality patterns or central places in the study area. In doing so, centrality as stated in the above passages in relation to its characteristics, the

techniques employed in the present study fall under the broad category of methods which have use the concept of 'threshold' as the basis of functional importance and its entry points. Berry and Garrison introduced the term threshold mainly to describe the amount of purchasing power to support a function or service. But in the present chapter, the term 'threshold' has been used to see the lowest number of population at which a given facilities or functions occurs. In doing so, by examining a number of central places and their functions and arranging the centres in descending order of population the threshold population could be work out. Threshold population of different facilities/functions usually differs but tends to increase according to the importance of the facilities/functions.

On the basis of threshold population of each and every facility, the main centres have been carefully chosen after indentifying the main centres of the area; the second task is related to as to how the various facilities can be added together, as they vary in their nature. For the same, various criteria of aggregation or preparing the composite centrality index have been given by many geographers. Wanmali (1972)[6] adopted arbitrary weightage method and applied for preparing the composite index. He gave the weightage according to the standard of the facility. For instance, the primary school is the lower order facility of education than college. He assigned weight 1 for primary school and weight 4 for college. But this criterion of assigning the weightages to the facilities/functions does not seem useful because the importance of a particular function is directly related to its locational position, not its status. In one area, suppose, there is only one college and all the children of surrounding interior area are coming to avail that facility there, thus, the importance of college is much significance. If the same facility is available at two or three centres, then, its significance will be less. Therefore, the importance of facility is related to its locational importance. Particularly in the studies of spatio-functional organization, a distance is an important factor. Therefore, locational

importance of a particular facility is the suitable criteria for assigning the weightage.

Bhatt and others (1976)[7] on the other, stated that, greater the scarcity, greater the importance in terms of centrality. As a result, the higher relative weightages should be given to such facility. By dividing the total number of the settlements by the number of the centres having the facility, the relative weightage for each and every facility have been calculated. Second, the total centrality score of a particular location is calculated by aggregating them.

The present concept of finding out the centrality scores has been statistically given by Bhatt and Others (1976) in the following manner:

$$W = (N/F_i) \text{ and } C_j = \sum_{i=1}^{k} W_i X_{ij}$$

Where, i = 1, 2, 3… k for centres having facilities,

j = 1, 2, 3…N for total number of the settlements,

F = number of the centres having facility,

W = functional weightages,

C = composite value,

X = frequency of the facility on the centres.

The third question is related to the methodological aspects to show the distribution according to the functional hierarchy of those centres which have been included in the present study. The horizontal and vertical distribution has been shown by preparing the graphs and distributional maps. The horizontal distribution of these central places is also done by putting the related data on the graphs. It is obvious therefore, that the scattered diagrams of distribution of these centres would give the clear cut clusterization. With the help of this cluster approach of the graphic method, the total centres of the district are classified into four categories. The salient features of these various functional levels have been described separately in the next part of this chapter.

In the light of above methodological approaches, the Spatio-functional patterns/facilities have been studied in the present discussion in the following manner. In fact, the size, facilities/functions and distance relationships of places of location are among those important factors that determine the spatio-functional patterns of the area.

5.1.1 THRESHOLD POPULATION

In the present study, in order to overcome the theoretical difficulties in measuring the relative value of the variety of facilities/functions, the concept of population threshold indices has been followed. Generally speaking, the minimum population which is necessary for establishment of a particular service is known as the threshold size of the service. In fact, this is the lowest level or the number of population at which a given function occurs. It is pertaining to mention here that, Threshold population of different function/facility varies, but tends to increase according to the importance of

functions/facilities and generally increases in the number of function with the increase in the functional size of the centres.

The concept states that, there is a range of population size for each function, below the lower limit of which all settlements lack that function, while above its upper limit all settlements possess it. Following this same criterion of the threshold population for each of all the existing 13 major facilities/amenities distributed among settlements of the district, the threshold population for facilities has been computed **(Table. 3.42**). It ranges from 16 persons in case of primary school, 54 persons for Middle school, 29 persons for High school, 226 for Higher Secondary school and 56 for College respectively. The health centres however the range of population from 79 persons for PHC to 1043 persons as maximum for the facility of the location of the CHC and as high as 61,797 persons for the facility of the location of the District Head Quarters has been computed (**Table. 3.42).**

Table 3.42

Threshold Population of various Facilities/Amenities

Facilities	Threshold Population	Name of the Villages and CD Block Head Quarters
A. EDUCATION: i) Primary Schools	16	Sarthe Kro (Nilip CD Block)
ii) Middle Schools	54	Rongplimplang Bazar (Lumbajong CD Block)
iii) High Schools	29	Jari Engti (Lumbajong CD Block)
iv) Higher S Schools	226	Tumpreng (Rongkhang CD Block)
v) Colleges	56	Jor Teron (Samelangso CD Block)
B. HEALTH : i) CHC	1043	Tika (Rongkhang CD Block)
ii) PHC	79	Dengaon No.2 (Samelangso CD Block)
iii) PHSC	84	Parkup Pahar No.1 (Rongmongve CD Block)
iv) MCWC	163	Thekelangjun Bazar (Samelangso CD Block)
v) SD	311	Karkok By Gaon (Howraghat CD Block)
vi) FWC	310	Hojaipur (Lumbajong CD Block)
vii) OTHERS	106	Engchin Langso (Rongmongve CD Block)
C. ADMINISTRATION i) District H.Q.	61797	Diphu (Lumbajong CD Block)

Source: Researcher's personal computation based on District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

Abbreviations:

CHC (Community Health Centres), PHC (Primary Health Centres)
PHSC (Primary Health Sub Centres), MCWC (Maternity Child Welfare Centres)
SD (State Dispensary), FWC (Family Welfare Centres)
OTHERS include Non Government medical facilities Charitable.

The above computed shows that, threshold population value for the facility of primary school is 16 persons for the district. It shows that in existing conditions, on an average, a settlement with a population of 16 inhabitants is being served by a primary school in the district. In other words, it can be stated that a settlement having a population of 16 persons is supposed to sustain the location of a Primary school in the existing state of the spatio-functional facilities in the district. Similarly, it is observed that a settlement with the population of 54 inhabitants is being served by a Middle school in the district, while, Higher Secondary School facility is available at the minimum of 226 persons in a settlement in the district followed by a College facility with the population of 56 inhabitants in a settlement in the district. In general, it can be stated that the lower order of facility in the district are available up to the minimum level of 16 inhabitant centres. But the administrative facilities are available only on a few locations, namely, District Head Quarters, Block Head Quarters and Police Station Head Quarters. As a result, the centrality of these higher order centres must always be higher than the others. The threshold population of various facilities/amenities would be helpful for identifying the centres/ nodes of the area.

5.1.2 IDENTIFICATION OF THE CENTRES

Identification of the centres, at the very outset, needs to determine some quantifiable personality of each centre or settlements existed in the study area and their inter-relationships among the functions. For identifying the centres in relation to availability of facilities, many may consider the analytical base on the actual distribution of the types of actual functions/facilities and the number of establishments under each type at every central place. But in the present study, to remove the short comings in the identification of the centres and their facilities, first of all simply the total numbers of the facilities of the district from which each and every considered facility have been gathered. Secondly, percentage shares of facilities/ amenities have also been computed in

order to secure the composite centrality scores of the facilities in the district **(Table 3.43**).

Table 4.43

Percentage share of Facilities/amenities incorporated in the study

Facility	Total No. of Facilities in the district	No. of Facilities considered	% of Facilities incorporated
A. EDUCATION:			
i) Primary School	1812	362	19.98
ii) Middle School	410	225	54.88
iii) High School	97	58	59.79
iv) Higher S School	13	08	61.54
v) College	03	03	100.00
B. HEALTH :			
i) CHC	05	05	100.00
ii) PHC	23	18	78.26
iii) PHSC	37	24	64.87
iv) MCWC	02	02	100.00
v) SD	11	08	72.73
vi) FWC	04	03	75.00
vii) OTHERS	09	05	55.56
C.ADMINISTRATION:			
i) District H.Q.	01	01	100.00

Source: Researcher's Personal computation based on District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

After having computed the percentage shares of the facilities incorporated in the present study, it is observed that more than 80 percent shares of the facilities have emerged out in the present study **(Table 3.43).** The computed table shows clearly that the percentage shares of most of the educational facilities have recorded more than 50 percent in the district. Even in the case of Health facilities more than 60 percent of the facilities are being considered rather incorporated in the present study. All the administrative facilities have been incorporated on 100 percent basis as because they are higher level function and playing the most significant role in the distribution in the study area.

Altogether 221 centres have been identified from the census 2011, where more than 2 facilities are available except for a few centre having a single facility is also

considered. All these centre in fact; have more than 80 percent strength of the total facilities/functions available in the district. The distribution of the aggregated picture of facilities available on those centres is shown by giving the relative weightage to each and every facility and aggregating them into a single index.

5.1.3 WEIGHTAGES

There are several methods to work out the relative importance of functions/facilities based on the approaches of weighting and ranking the given function/ facility according to one's choice or individual's normative decision. In the present study, for computing the importance of functions, weightages have been worked out separately for all the 13 major facilities/amenities as given in the **Table 3.44** considering the areal importance of a particular facility, relative weightage (W) given to each of the functions have been calculated with the help of formulae given by Bhatt and Others (1976)[8] which has already been described in the earlier part of the chapter**.**

Keeping in view the above mentioned weightage formulae, weightages for each of all the existing 13 facilities/amenities distributed among centres of the district has been computed **(Table 3.44).** The functional weightage has been recorded ranging from 1.55 in case of primary school to 2712.00 as maximum for the administrative facility of district Head Quarters. Similarly weightages values for the remaining facilities/amenities have also been calculated following the same method mentioned above. It is observed that, the weightage values of particular facility decreases with the increase in the number of centres having facilities and vice-versa. The most striking feature of the resultant weightage observed in the study is that, higher the number of centres having facilities, lesser the value of its weightage exists. For instance, the total number of centres having primary schools in the district is recorded as high as 1745 with its weightage value of 1.55 only. Similarly, in the case of Health, the highest number of the centres having the facility is observed in PHSC as 37 with its weightage value of 73.30. On the other hand, the District level Administrative facility has only one centre, which is the District Head Quarter having the maximum weightage value of 2712.00.

Table 3.44

Major Functions/Facilities and Weightages

Total No. of Settlements = 2712

Facilities	Total No. of Centre having facilities	Weightages
A. EDUCATION:		
i) Primary School	1745	1.55
ii) Middle School	304	8.92
iii) High School	92	29.48
iv) Higher Secondary School	13	208.62
v) College	03	904.00
B. HEALTH :		
i) CHC	05	542.4
ii) PHC	23	117.91
iii) PHSC	37	73.30
iv) MCWC	02	1356.00
v) SD	11	246.55
vi) FWC	04	678
Vii)OTHERS	09	301.33
C. ADMINISTRATION:		
i) District H.Q.	01	2712.00

Source: Researcher's Personal computation based on District Census Hand Book, Karbi Anglong, Series-19, Part XII-A, Census of India-2011, Assam

5.1.4 CENTRALITY SCORES

The centrality scores which are assumed by different functions are the indicative of their relative importance which can be used for inter-functional comparison of the hierarchy of central function in the study area. It is assumed that the centrality scores are primarily related to the population size of the centres. By adopting Bhatt's formula, the centrality scores for each and every centre considered for the study area have been calculated for 2011**(Appendix-I)**. The formula explains that the weightages value for each and every facility is multiplied by the number of the facility available at each centre and then added together in order to obtain the composite scores.

Giving the composite centrality scores of all the facilities according to their relative performance for 2011, the centrality scores are observed higher on a few centres only. During the last decade though the functions /facilities were insignificant in their

number as well as in scores, the highest scores was recorded up to 6858.74, while minimum scores was recorded up to 9.61. Most of these centres having higher density of population had the maximum centrality scores.

In 2011, the centres having the value of centrality scores above 5000 was recorded only in one centre i.e. in Diphu (6858.74) under Lumbajong CD Block with a total population of 61797 where a total of 87 numbers of the main facilities/functions were recorded. There were altogether 2 centers having its centrality scores ranging between 4000 - 6000 i.e., Bokajan (4525.51) and Baithalangso (4425.76). The third order of centrality score were recorded in four centres namely, Hamren (3690.92), Howraghat (3484.70), Donkamokam (2303.47) and Dokmoka (1645.93) respectively. Besides, there are also 214 centres of Very Low Order emerging service centres having the centrality score ranging from 9.61 to as high as 1430.80.

The distribution of computed scores reveals that the centres having above 6000 scores was recorded only in one centre followed by the second order of centres ranging between 4000–6000 scores in 2 centers and the third order centrality scores ranging between 2000-4000 in four centres **(Fig 1.16, 1.16 (a) & Table 3.45).** The figures show clearly that, these higher order centres are mostly the town/urban area and are well connected by metalled roads. Going through the computed scores, it is also found that most of these higher order centres are in fact located along with the main roads. Therefore, transport routes are considered one of the most important and the main channels for the development of the socio- economic facilities in the area. The ranks of the centres according to their computed centrality scores have been explained in the next part of this chapter.

KARBI ANGLONG

CENTRALITY SCORES

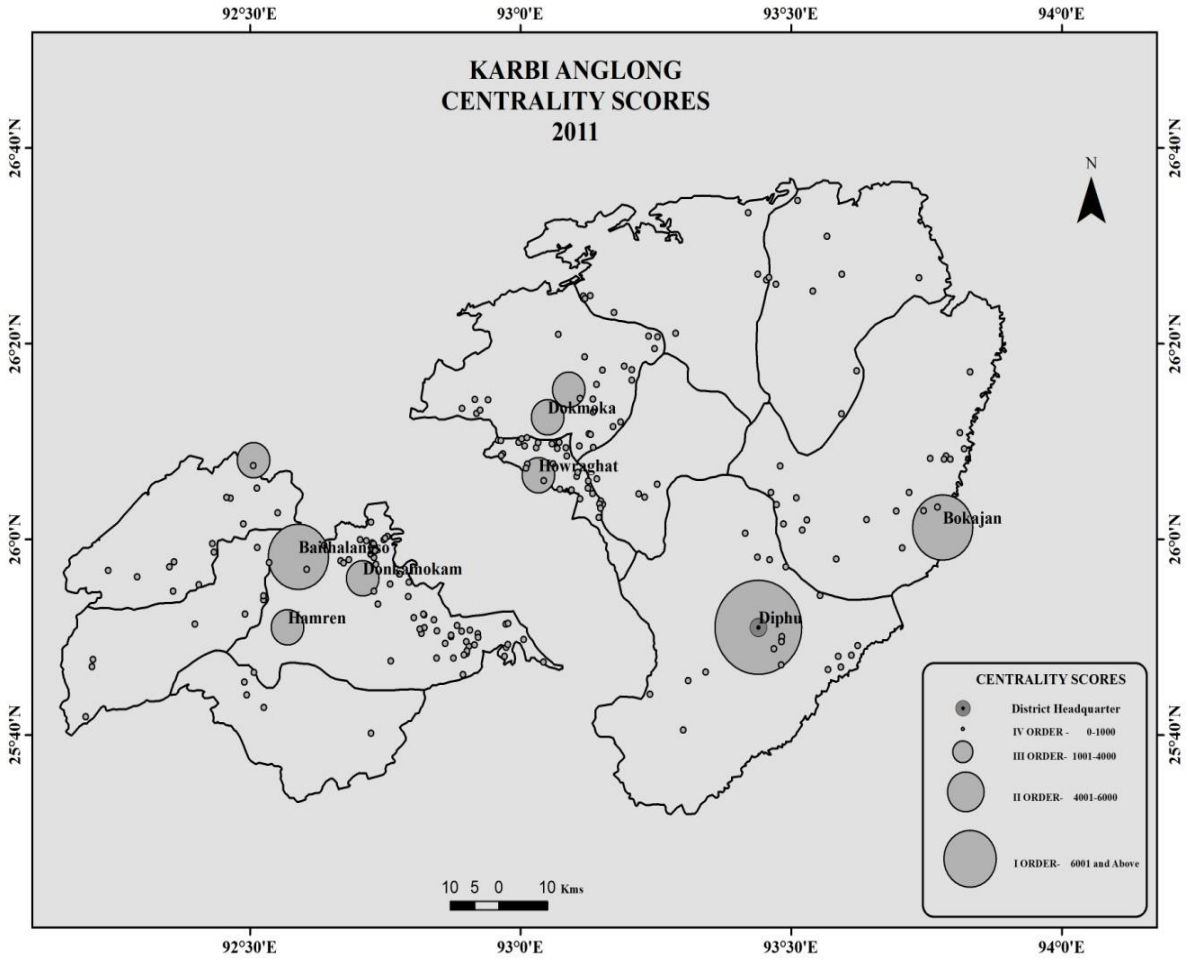

Fig. 1.16

Source: Survey of India map

KARBI ANGLONG

CENTRALITY SCORES

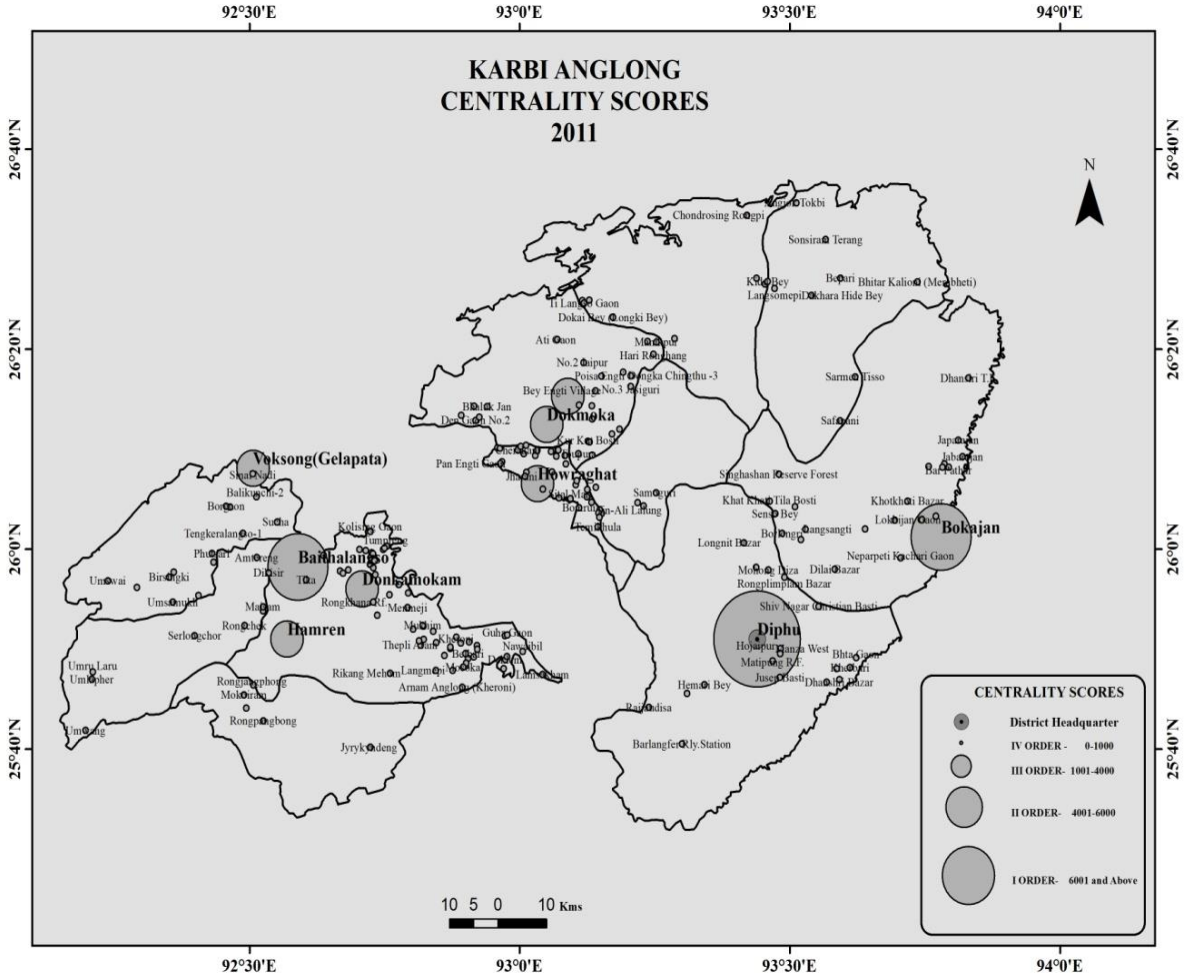

Fig. 1.16 (a)

Source: Survey of India map

5.1.5 FUNCTIONAL HIERARCHY:

To understand the functional structure and the relative importance of centres of the study area clearly, the identification of the functional classification of socio-economic facilities becomes a significant point of consideration. In fact, variety of functions produces a variety of hierarchic levels based on their individual functional gravity. Thus, the hierarchic orders of a function or functions located in a centre reflect the hierarchic level of that centre. Therefore, in the present study, the grouping of the centres has been made on the basis of putting their centrality scores against their

population size on the Dispersion diagram (**Fig.1.17**) that would give the clear picture of functional homogeneity of the centres. This diagram shows that, there are four clear cut clusters of the points. On the basis of this clusterization emerging out in the distribution, the four levels of the functional hierarchy are identified for 2011. The identified four hierarchic orders of centres dealing with their vertical classification in relation to their distributional and functional characteristics have been explained systematically in the following succession.

KARBI ANGLONG
DISPERSION DIAGRAM

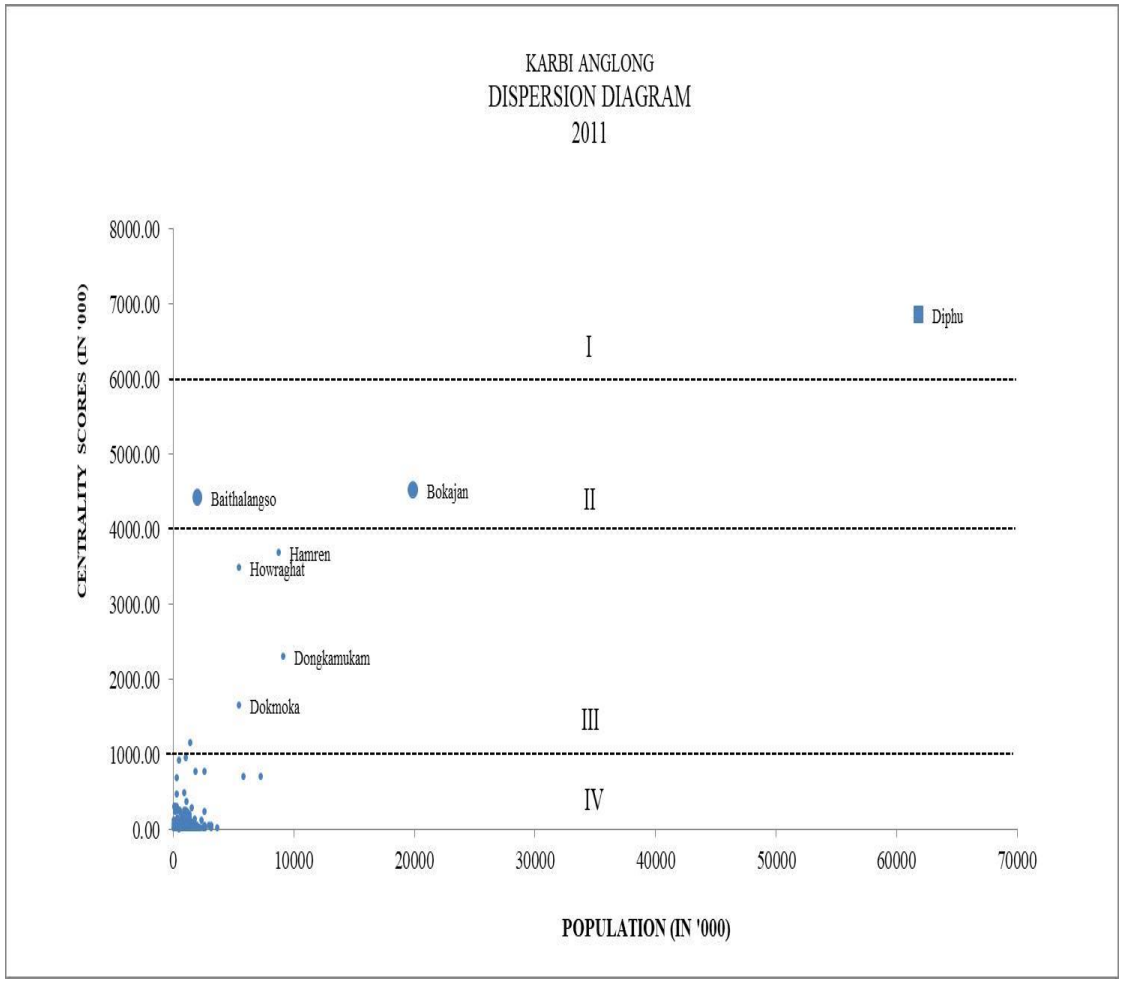

Fig 1.17

Source: Researcher's personal computation

Table 3:45

Nature of Facilities at various Levels

Orders	Nomenclature	No. of Centres	No. of the Facilities available	Nature of the Facilities
I	High Order service centres	1	87	PS-35, MS-29, SS/HS-12,HSS-4, JC/C-4,CHC, SD, FWC,
II	Medium Order service centres	2	64	PS-20, MS-22, SS/HS-5, HSS-5, JC/C, CHC-2, PHSC, MCWC-2, SD-3, FWC-2, VET,
III	Low Order service centres	4	79	PS-35, MS-12, SS/HS-7, HSS-10, JC/DC, CHC-4, SD-6, FWC-4,
IV	Very Low Order emerging service centres	214	811	PS-317, MS-290, SS/HS-90, HSS-12, JC-01, CHC-02, PHC-24, PHSC-42, MCWC-01, SD-10, FWC-03, VET-11, OTHERS- 08
	Total	**221**	**1041**	

Abbreviation: PS=Primary School, **MS**=Middle School, **SS/HS**=Secondary School/High School, **HSS**=Higher Secondary School, **JC/C**=Junior College/Degree College, **CHC**= Community Health Centres, **PHC**= Primary Health Centres, **PHSC**= Primary Health Sub Centres, **MCWC**= Maternity Child Welfare Centres, **SD**= State Dispensary, **FWC**= Family Welfare Centres, **VET**=Veterinary, **OTHERS** include Non Government Medical facilities-Charitable

The computed **Table 3.45 shows** that, the highest order of centre in the district recording the 1st order service centre of functional hierarchy has been observed only in one centre i.e. in Diphu (HQ of the district) with its composite score of 6858.74 as the functional gravity under Lumbajong CD Block with a total population of 61797 persons. The total number of facilities recorded in this higher order service centre was 87. The facilities available in this centre are Primary School (PS), Middle Schools (MS), Secondary School/High School (SS/HS), Higher Secondary School (HSS), Junior/Degree College (JC/C), Civil Hospital (CH), Community Health Centre (CHC), State Dispensary (SD), and Family Welfare Centre (FWC). Besides, there are also facilities, like Post Office, Electricity, pucca roads, Daily market and so on. It is

interesting to note that, the functional facilities in this higher order service centre are mostly of higher order facilities.

In the Second order of service centre, 2 out of all the 221 centres of the district were belong to the medium order service centres attaining its centrality scores of 4525.51 at Bokajan and 4425.76 at Baithalangso centres and a population of 19877 and 1987 persons respectively. The total number of facilities recorded in this medium order service centre was 64. In this medium order of service centre, the facilities available are Primary School (PS), Middle School (MS), Secondary School/High School (SS/HS), Higher Secondary School (HSS), Junior/ Degree College (JC/C), Sub Divisional Civil Hospital (SDCH**)**, Community Health Centre (CHC), Primary Health Sub Centre (PHSC), Maternity Child Welfare Centre (MCWC), State Dispensary (SD), Family Welfare Centre (FWC), Veterinary (VET). Of these two centres, both the centres are belong to urban centre and are also situated along with the main road.

The functional range of Third hierarchic order of centres ranging its composite scores from 1645.93 to 3690.92 includes as many as 4 centres. The total number of facilities available in this Low order service centres was 79. The major recorded facilities in this category are Primary School (PS), Middle School (MS), Secondary School/High School (SS/HS), Higher Secondary School (HSS), Junior /Degree College (JC/C), Community Health Centre (CHC), State Dispensary (SD), Family Welfare Centre (FWC).

The computed **Table 3.45** shows that, 214 out of all the 221 centres of the district were belonging to the lowest order level, i.e. to the 4^{th} order. These lowest order service centres are the very Low order emerging service centres. The total number of facilities recorded in this lower order service centre was 811. It is observed that, these centres are mostly of rural in their nature and are located mainly in those areas where they are part of the plain and are connected to road connectivity. The main facilities recorded in this lower order category are Primary School (PS), Middle School (MS), Secondary School/High School (SS/HS), Higher Secondary School (HSS), Junior College (JC), Community Health Centre(CHC), Primary Health Centre (PHC), Primary Health Sub Centre (PHSC), Maternity Child Welfare Centre (MCWC), State Dispensary (SD), Family Welfare Centre (FWC), Veterinary (VET), Non Government Medical facilities-Charitable (OTHERS). The functional gaps in this category from one centre to the other

are remarkably greater than the other orders. It is interesting to note therefore that, the facilities available in this lower order service centre are mostly recorded along the road sides and the areas away from the road connectivity are far lagging from these facilities. From the point of personal visit during the field survey, it is observed that, most of the areas away from the town or urban connectivity are lagging behind from having these facilities for which there seems a spatial imbalance in the distribution and the remote areas are not getting rather facilitated by these nodal points. Therefore, a few strategic nodal centres may be suggested for the balanced development in the area which has been described in the next chapter by concluding the main results of the study.

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CHAPTER – VI

SUMMARY AND CONCLUSIONS

CHAPTER-VI

SUMMARY AND CONCLUSIONS

In the foregoing chapters of the study, the Introduction of the Study area dealing with Conceptual background, Statement of the problem, Review of literature, Objectives, Research questions, Methods and data Base, Chapterization; Geographical framework of the study area; Natural and human resources and their distributional patterns; the Locational patterns and the spatial distribution of Education and Health facilities basing on the formula of Centrality scores; Spatio-functional patterns have been broadly described.

As discussed in the preceding chapters, the study area largely comprises of hilly areas in comparison to the plain areas. Amri, Chinthong, Socheng, Samelangso, Rongmongve, Nilip and Lumbajong CD Blocks are located predominantly in the hills. On the other, Rongkhang, Bokajan and Langsomepi CD Blocks have sizeable plain areas along with the hills. In the case of Howraghat CD Block, the entire block is located in the plain areas.

It is observed that, the hilly areas have sparse population due to its physical conditions as compared to the plain areas. It can also be seen that, four CD Blocks, i.e. Bokajan, Rongkhang, Howraghat and Lumbajong have low Scheduled Tribes (ST) population. Coincidentally, these four CDBs have relatively higher literacy rates in contrast to those CD Blocks which are either mostly hilly or have highest ST population. Thus, two distinct groups of CD Blocks can be observed in the study area with respect to physical conditions and the population.

It is clearly observed from the above discussion as well as explanations that the resource structure of the area in particular has played an utmost importance in the distribution of Education and Health facilities and functions in the study area. The region is home to many tribal people and is predominantly inhabited by the Scheduled Tribes (STs) making up around 5.6 percent of the total population under Karbi Anglong District. It is also observed that more than 80% of the rural population of the district is engaged in agricultural activities. Further, it is observed that, the distributions of these facilities are concentrated only on a few locations where most of the road transportations and communications are available and consequently, the functional facilities and patterns

are not to that of normative conditions of resource availability. In fact, there seems the functional gaps from one location/center to the other.

FINDINGS

The initial findings of the present study are mainly based on the inherent characteristics of spatio-functional facilities of education and health in the Karbi Anglong District. After interpreting the existing spatio functional facilities, following salient features of the study area, and a few but important findings can be drawn successfully which are described in the following heads –

- The district Karbi Anglong is richly endowed with natural resources. The district- the mesmerizing hill district blended with dense tropical forest covered hills, its bounty of flora and fauna and flat plains is mostly dominated by low hills with gentle slopes.

- It is found that 70% of the topographic conditions of the study area are characterized by undulating topography mostly dominated by low hills with gentle slopes and only 30% of the area is plains.

- It is also clearly observed that the resource structure of the area in particular has played an utmost importance in the distribution of functions and facilities of education and health in the district. The region is rich in natural resources and agriculture is the mainstay of the rural people of the district.

- Almost 77 percent of the geographical area of the district (State of Forest Report, 2017) is under forest cover- the largest in the entire state of Assam (Forest Survey of India, 2017).

- Further, it is observed that, out of the total geographical area of 10,434 sq.km only 37 sq. km is urban and the rest 10,397 sq.km rural area. The study area is situated in the central part of Assam between $25^0 33^/$ N to $26^0 35^/$ N latitudes and $92^0 10^/$ E to $93^0 50^/$ E longitudes. The district accounts for about 13.53 percent of the state's total geographical area of 78,438 sq.km with a total population of 9, 56,313 (2011) of which 88.18 percent resides in rural areas and 11.82 percent in urban areas. The district shares 3.05 percent to the total population of Assam

which comprises 56.33 percent ST population and 4.70 percent SC population. On the other hand, the present rate of literacy in the district as per 2011 census (69.25%) is low compared to other districts in the state, while density of population records only 92 persons per sq. km and the sex ratio is 951 females per 1000 males. Out of the total population in the district 40.10% are workers, while 59.90% are non-workers.

- The entire district is divided into 3 sub divisions- Bokajan, Hamren and Diphu Sadar Sub division. The district is comprised of 2712 inhabited and 209 unhabited villages, o4 Revenue circles, 02 Administrative divisions, i.e., East and West division, 20 Police stations and 06 Town committees and as many as 11 Community Development Blocks (CDBs) as per 2011 census.

- The district is largely a hilly region with the plain periphery in the northern and eastern side and partly hilly periphery in the southern and western side. The general relief of the eastern part of the region is less rugged than the western part of the study area. The general soil conditions of the district contains high quality of organic and nitrogen. The laterite soils are found in part of Hamren sub division. Deposits of new alluvium are however found in the river valleys. On the other, old alluvium are found along the western portion of the Hamren plateau.

- The district primarily an agrarian is blessed with numerous rivers and tributaries. Because of favorable agro-economical conditions of the area, more than 80% of the rural population is observed engaged in primary sector in agricultural activities, while very few working force is employed in secondary sector. It experiences and enjoys different climates in different parts due to variation in the topography. As a result, rainfall is not uniform throughout the district. The summer temperature ranges from 23^0c to 32^0c and records as high as 36^0c, while in winter; it ranges from 6^0c to 12^0c. The average annual rainfall ranges between 1155.6 mm and 1424mm with rainiest months from June to August.

- On classifying the primary existing facilities and functions of the district into two major heads, it is found that the spatial analysis determines a variety of patterns of their distribution. It is observed that, the settlements located in the close vicinity of urban centres show a state of having more facilities and functions

rather than the settlements located in the remote areas in the district. The maximum number of facilities and functions is found to be shared by the medium sized settlements having a population more than 1000 persons. Baring few exceptions, no higher order facilities are found in the settlement having population of less than 500 persons in the district. It is observed that, the urban areas/centres being experienced high level of distribution of facilities and a high density of population have the maximum number of facilities as well as functions.

- Before Independence, the Karbi Anglong District had no separate identity. The people of Assam saw the birth of a new district named as the United Mikir and North Cachar Hills (UM & NCH) District emerged on the 17th November, 1951. Subsequently, as per the provision of the Sixth Schedule, the Mikir Hills Autonomous District Council was inaugurated on 23rd June, 1952. This was followed by bifurcation of the erstwhile district of United Mikir and North Cachar Hills District into two separate districts under the banner as Mikir Hills and North Cachar Hills District in 1970. The Mikir Hills District was again rechristened as Karbi Anglong District w.e.f. the 14th October 1976. Thus, Karbi Anglong came into being as a full-fledged separate district in the map of Assam with its Head Quarters at Diphu the first hill town of the entire state of Assam after the formation of Meghalaya State. Presently, the district enjoys autonomy under the provision of Sixth schedule of the Indian Constitution. It is the largest district of Assam in terms of its total geographical area.

- The spatial patterns of educational facilities are interrelated and interdependent with the pattern of socio-economic development of an area. The infrastructure of education is a very important indicator to determine the level of development of any region. It is widely accepted that, economic levels are much more align to expansion of educational facilities. It can be easily said that the region with more educated inhabitants is probably well developed. However, it is observed from the study that, in village/rural areas the infrastructure of education is less as compared to that of urban/town areas. Maximum numbers of lower orders of educational institutions are noticed in rural areas.

- The development of education in Karbi Anglong district prior to the Independence was a totally neglected issue and less effort was done to develop education in the district. Formal education in the district was introduced by the Christian Missionaries only as early as 1860's. Initially during that time only one school run by the Christian Missionaries at Tika Pahar received some educational importance in the entire district. There was no script and education as well among the people in the region. There was a dearth of education facilities in the region in that time and therefore, the picture of increase in number of educational facilities were very negligible. Till 1950, there were only a few schools in the district. But following the creation of separate Karbi Anglong District Council in 1952, a great rather a remarkable headway made in the field of education (by the district council authority) could be seen.

- It is recorded that, there was 180 primary schools in 1953 which was increased to 1812 in 2011 in the district of which 1674 (92.38%) schools were run by Govt. institutions and 138 (7.62%) schools were run by private institutions. It is however observed that, the progress rate of primary schools in the last 55 years (1953-2008) was 23 schools only, whereas during the year 2008 to 2011, it was, recorded 33 schools.

- The above explanation further reveals that, out of the total 11 Community Development Blocks (CDBs), Howraghat CD Block recorded the highest number of 277 (15.29%) schools, while, Socheng CD Block recorded the least number of schools of 67(3.70%) only.

- The breaking up of urban and rural wise distribution of schools also reveals that, there is more number of primary schools in the rural areas than urban areas in the district. Presently, there are 1977 primary schools in the district as per the year 2016**.** Out of the total number of 1977 primary schools, 1870 (94.59 %) are located in rural areas against 107 (5.41 %) numbers in urban areas. The highest number of schools in urban areas are observed in Lumbajong CD Block (40%) while, in rural areas the highest number of 239 (13%) schools are found in Rongkhang CD Block.

- It is clearly observed that, the primary schools in the region are mostly located scattered in the rural areas than the urban areas and are of rural in nature. Out of the total 2712 inhabited villages, only 1745 inhabited villages have primary schools facilities covering all the 1812 primary schools (2011), whereas, 1176 inhabited villages are deprived of such facilities.

- Though the numbers of the schools has been increased marginally in rural areas but these are found to be disproportionately concentrated. Most of the schools in the rural areas are found in dilapidated conditions and left without any up gradation and repairing. There are some primary schools which do not have even separate class rooms. All the classes go on together at a time in the same room/hall which creates a chaotic situation for both the teachers and pupils.

- It is also found that, in some schools there is no sufficient furniture, teaching aids. Moreover, the most essential things i.e. pure drinking water facility, power supply facilities are also not available in those schools especially in the remote rural villages.

- Further it is revealed that, the beginning of the middle schools in the district had been started with the establishment of Tika Govt. School in 1935 at Tika pahar area. Prior to independence, there were only 5 M.E. schools and 9 Middle schools in the entire district before the formation of Karbi Anglong District Council in 1952. Since education had not been received utmost importance in the district before independence, the numbers of Middle schools were also not considerable. As per the year of 2016, out of the total 356 middle schools, 29 are found to be located in urban areas, while 327 are in the rural areas.

- A great change and development in the field of education however, could be seen in the district since the entire role is being played by the District Council Authority. As a result, the number of Middle Schools increased up to 321 during 2002-03 and the gradual increase in the total number were continuously seen since 1953 up to 2006 and from 2006 to 2011. In the year 2011, there was a little increase in the number which was increased to 410. Out of these, 385 were run by the Govt. institutions and 25 were run by private institutions. Amongst the CD

Blocks, Rongkhang CD Block recorded the highest number with 144 middle schools during 2011.

- But on the contrary, a marginal decrease rate from 410 to 356 could be observed in the total number of Middle schools during 2016. Of these total 356 middle schools, 29 are located in urban area while, 327 are in rural areas. Amongst the highest number of Middle schools located in urban areas was observed in Lumbajong CD Block with 12(41%) while, the distribution in the rural areas was observed highest in Howraghat CD Block with 52(16%).

- It is also observed that out of the total 2712 inhabited villages; only 304 inhabited villages have Middle Schools facilities covering all the 410 Middle Schools (2011), where as 2617 inhabited villages are deprived of these facilities.

- It is therefore necessary that the local concerned authorities take necessary but positive steps in solving the problem of expansion of Middle Schools in the district.

- Furthermore, it is also observed from the study that, out of the total 2712 inhabited villages, only 92 inhabited villages have been covered by Secondary schools facilities where as 2829 inhabited villages are deprived of the facilities thereby making the people of the areas far behind from getting such facilities.

- The study also reveals that, the present number of the Secondary schools facilities in the entire district compared to its present population and the geographical area, it is not at all sufficient for which the rate of literacy is still low.

- Therefore, the need of the hour is to expand the number of Secondary school education facilities in its fullest capacity by the Government authorities by adopting qualitative measures for the greater interest of the people of the district.

- Looking at the uneven distribution of the number of educational institutions in the entire district, it is clearly found that there is a wide gap in the distribution of existing number of educational facilities compared to the population size and the demand of the people in the district.

- In the slow developing economy of hill tribes, the education is much more significant than any other element of development (that has to be looked into).

- The present study further reveals that, the most common educational institutions found in the rural areas are mainly Primary schools, Middle schools and at the most Secondary schools, where Degree College(Govt. & Private owned) and Professional Colleges are found to be located in the urban areas.

- Besides, 2016 data shows that, there are 28 numbers of Higher Secondary Schools, 05 KGBV and 15 Junior/Degree College of various streams-Arts, Science and Commerce (Govt. & private), 05 other higher educational institutions like ITI, Polytechnic, Law College, B. Ed College and a University campus in urban as well as rural areas in the district.

- From the present analysis, it is clearly observed that the present numbers of Higher Secondary Schools in the district also is not sufficient for the population size and needs of the people of the district. Moreover, it is found from the study that, there are gaps in the distributions of these institutions as per the demand of the people of the region.

- Looking at the scenario of Higher educational institutions in the entire district, it was found that, the higher education in the district was a very griming look. Prior to the independence, there was no higher education in the district of Karbi Anglong. Amongst the Degree Colleges, Diphu Govt. College which imparts education not only for Degree courses (Arts, Science and Commerce) but also for Higher Secondary courses is the only premier college located at the vicinity of the town in the district.

- The rural and urban wise distribution of colleges also shows that all these institutions are concentrated only in urban areas leaving out rural areas to nil (zero). The study further reveals that, there is also disparity in both urban wise as well as rural wise distributions of these educational facilities. As a result, most of the CD Blocks have since long years been seen to be out of reach of these educational facilities.

- From the above analysis it is therefore, clearly understood that, the existing number of schools and colleges seem to be insufficient and cannot fulfill rather commensurate the change in demand of the people of the entire region. It has also been observed that, although the state government as well as the district council authority has been engaged in expanding education facilities in the district, yet, it is lagging far behind in comparison to other neighboring districts in this regard and the entire distribution of the educational institutions across the district is highly dispersed.

- Furthermore, it is observed that, the areas of rural in their nature in the district are poor in almost all the education as well as health facilities and services. In case of education even if it is available, these are mostly of lower order facilities like, primary schools and middle schools. On the whole, starting from the lower order of facilities to higher order facilities are located or concentrated mainly in the urban areas and in the settlements where road communications are well connected. The entire West Karbi Anglong sub division and Bokajan sub division as well as in some pockets of Diphu sub division most parts of the areas are still quite insignificantly facilitated by these facilities.

- The data on the distribution of education facilities also reveals that the town area-wise distributions of education in the district is not evenly distributed. There are six towns and one census town (CT) with a total population of 1,12,966 and a total geographical area of 37.45 sq.km. Out of these six towns, Diphu Town ranks the highest in number of both govt. as well as private educational institutions.

- Looking into the total numbers of educational institutions, it is observed that, Laharijan Natun Bosti (CT) fared poorly in all counts.

- It is found that the overall number of educational facilities as well as the density of these educational facilities in the district has been increasing averagely though not very significantly. On the other, the locational intensity of these facilities is very low and scattered in distribution. In fact, the average intensity of all these educational facilities in the district does not correspond to all the settlements available and are not satisfactorily available in the district

- Thus, the main emphasis should be given to establish more number of educational institutions and provide facilities in its fullest capacity by the concerned authorities by adopting qualitative measures for the greater interest of the people in the district. Moreover the children population requires more educational facilities which are very less in number in the district.

- **On the other,** while analyzing the distribution of health institutions in the district, it is found that the overall health facilities in the district are insignificant in number. The picture of health facilities excepting the few urban/town areas and the areas located nearby the urban areas where every necessary facilities is available, in general seems very unsatisfactory. Health facilities / services in the district are found to be located mainly in the urban areas only and on a few locations which are confined to some larger sized villages where the size of the population is very high. It is observed that, altogether 414 inhabited villages have been covered by health centres in the district. The highest coverage figure of 76 (37.81%) villages is observed in Rongkang CD Block, while, the least number coverage are found in two CD Blocks which is less than 20 numbers in Chinthong and 14 numbers in Amri CD Blocks. In terms of percentage coverage to the total number of inhabited villages covered by health centre facilities, Lumbajong (6.24%) and Chinthong (7.97%) CD Blocks has the least percentage as compared to other CD Blocks (Table 3.30). Looking at the number and percentage of rural population coverage,

- It is found that only three CD Blocks have more than fifty percent coverage of the population served by the facilities, while the rest of the CD Blocks have below fifty percent.

- During the course of **field work** (data collection) done for the study, it was found (Inspection Book Mohongdijua Dispensary from 1930) that a dispensary was established in **Mohongdijua (**in present Lumbajong Block**) way back on 1st May, 1930 (plate no. 27-29**) under the jurisdiction of SDMO, Golaghat Sub-division of Sibsagar district. The Dispensary is presently located at Mohongdijua under Manja BPHC in Lumbajong CD Block of Karbi Anglong District. The records in the dispensary reveals that it has treated number of patients with Malaria, eye disease (conjunctivitis and blepharitis), ulcers, skin diseases,

diarrhea, dyspepsia, goiter, injuries and yaws, kala azar and leprosy cases were also reported in the neighboring places. The records also further reveals that the patients were mostly Mikirs (Karbis) and Kacharis (Dimasas). Incidentally, the Governor of Colonial Assam, Sir Robert Neil Reid, visited the dispensary on 29th October, 1940. The study reveals that the present numbers of dispensaries in the district are found to be located in such remote areas which are not easily accessible by road transportation connectivity especially under Donka circle in the West Karbi Anglong.

- Understanding the present spatial patterns of distribution of Dispensaries, there is an urgent need to establish more number of dispensaries in these tribal dominated hilly areas especially in those localities where there are no hospital facilities, as because dispensaries are the place connected with the hospital from which medical supplies and medicines are dispersed.

- The study also reveals that, there are marked disparities in the availability of not only in dispensaries but also in other health facilities which have now been the major problem especially in remote areas and localities in the entire district.

- The analysis also reveals that, the distribution of CHCs, BPHCs, MPHCs and SHCs are unevenly distributed across the region.

- It is observed that, between 2011 and 2019, the number of health institutions has increased in the district from 156 health institutions to 208 with Socheng CD Block showing the highest growth followed by Chinthong (**Table 3.38**). However, in absolute numbers, in 2019, Howraghat CD Block leads with 62 health institutions followed by Lumbajong CD Block with 30 health institutions. The data shows that the health institutions are not evenly distributed across the region but has however, improved from 2011 to 2019.

- On the other, the health institution-area ratio shows that the area coverage of the health institutions has marginally improved from 2011 to2019 for the entire region. At the block level, the situation has tremendously improved for a few CD Blocks. However, in the absolute terms, it is Socheng block with 1 health institution to 28 sq. km. and Nilip with 1 health institution to 24 sq. km are the CDBs that require attention in this regard.

- In case of health institution-population ratio also, the health institution coverage of the population in 2019 though has improved remarkably in some of the CD Blocks. However in absolute terms, it is Socheng Block with a health institution-population ratio of 1:6,834 has the most unfavorable ratio followed by Bokajan and Rongkhang CD Blocks.

- There is only 1 Civil Hospital located at Diphu (Lumbajong CD Block), 1 Sub Divisional Hospital at Hamren (Chinthonbg CD Block) 5 CHCs at Bakulia (Langsomepi CD Block), Bokajan, Howraghat, Dentaghat (Samelangso CD Block) and Dongkamokam (Rongkhang CD Block) and newly opened 3 Model Hospitals namely, Kheroni (Rongkhang), Deihori (Nilip) and Balijuri (Rongmongve) in the district of Karbi Anglong. Looking at the picture of location of health institutions, Amri and Socheng are the only CD Blocks without any hospital facilities.

- The study also reveals that, an increase in the distribution of health personnel can be observed for the entire district from 2011 to 2019. The highest increase in their number has been observed for Socheng CDB, while, the lowest has been recorded for Bokajan and Howraghat CDBlckss. But in absolute terms, Lumbajong Block with 144 health personnel as per 2019 data has shown the highest number, whereas , Socheng Block with 11 health personnel has the lowest numbers of health personnel. The data for health personnel shows therefore, that, the distribution of health personnel is also disproportionately distributed across the region.

- The health personnel- area ratio shows that, the most unfavorable areal coverage of health personnel can be observed in Socheng and Nilip which has 1 health personnel for 10 sq.km and 9 sq. km area respectively. However, the overall health personnel-population ratio, across all the CD Blocks can be observed that the situation has greatly improved from 2011 to 2019. In the study, it is found that Socheng CD Block has the most impressive improvement of all the CD Blocks from 1 health personnel against 13,667 persons in 2011 to 1 health personnel against 2,485 persons. In terms of most favorable health personnel-population ratio, Lumbajong Block with a ratio of 1:1,081 has the most favorable

ratio. Rongkhang on the other hand, with 1:2,612 has the most unfavorable health personnel-population ratio.

- Doctors are one of the most important pillars of health services. According to National Health Profile 2018, there are 1,041,395 registered allopathic doctors up to 2017 in the whole of India. In case of Karbi Anglong region, the total number of doctors stands at 214 in 2019 from 47 in 2011. These figures not only include Allopathic doctors but also incorporate Homeopathic, Ayush and Dental doctors (**Table 3.40**).

- From the study, it is observed that, most of the doctors in the district are concentrated in Lumbajong Block especially in Diphu. It is observed that, the situation however, has improved in 2019 and the district as a whole saw an increase of 44 percent doctors per annum. In absolute numbers, Lumbajong CD Block with 64 doctors has the highest number of doctors. On the contrary, Socheng with 4 doctors has the lowest number of doctors in the entire Karbi Anglong district.

- The data for doctors further shows that the Block wise distribution of Doctors is unevenly distributed across the district.

- During the course of study, it has also been found that the Doctor-area ratio in the district has greatly improved. i.e against 1 doctor covering 43 sq.km in 2011 to 1 doctor covering 9 sq.km in 2019. Between the year 2011 and 2019, the most notable decrease rather improvement in the doctor-area ratio from 1:113 to 1:28 has been seen for Socheng CD Block, followed by Chinthong CD Block where the ratio has come down from 1:90 to 1:7.

- In absolute figure, it is the Lumbajong CD Block with 1:4 has the most favourable doctor-area ratio in 2019. On the other hand, with 1 doctor covering 28 sq. km Socheng CD Block has the largest doctor-area ratio in the district.

- In case of Doctor-population ratio for the entire Karbi Anglong district in 2011 was 1:20,347 which has come down to 1:4,469 in 2019. This figure is however, almost four times higher than the WHO recommended doctor-population ratio of 1 doctor against 1,000 persons.

- The block wise data for Karbi Anglong district shows that the Doctor-population ratio is all above the WHO recommended figure. The most favourable doctor-populatiuon ratio in 2019 can be observed in Chinthong (1:2,127) followed by Lumbajong (1:2,433) and Amri (1:3,506). The highest doctor-population ratio can be observed in Bokajan (1:8,240) followed by Socheng (1:6,834) and Howraghat (1:6,441). It can be seen that, these three CD Blocks do not have enough doctors against its population especially in the case of Socheng CD Block the number of doctors is very low.

- As per data, Diphu Civil Hospital has 200 beds and Hamren Civil Hospital has 50 beds. Apart from these, the CHCs and Model Hospitals have 30 beds each. All the BPHCs, PHCs, MPHCs and State Dispensaries mostly have 6 to 10 beds whereas, the Sub centres, Family welfare sub centre; sub health centres have 1 observation bed each.

- In absolute numbers, Lumbajong with 222 beds has the highest number of beds and Socheng with 6 beds has the lowest number of beds. It is to be mentioned that the entire Karbi Anglong has altogether 552 beds. However, the data shows that the distribution of beds across the district is highly dispersed.

- The data for Bed-area ratio show that Lumbajong CD Block has the lowest ratio with 1 bed covering 1 sq. Km followed by Chinthong, Bokajan and Howraghat with 1 bed covering 3 sq. km. On the other hand, Nilip with 1 bed covering 21 sq. km has the highest bed-area ratio in the district followed by Socheng (1:19) and Rongkhang(1:11).

- The bed- population ratio also shows that, Lumbajong CD Block with 1 bed against 701 persons has the most favorable ratio, whereas Rongkhang CD Block with 1 bed against 5,572 persons along with Nilip, Socheng Amri, Bokajan and Howraghat CD Blocks show high bed –population ratio. The data in absolute numbers shows that, the distribution in both bed-area ratio and bed population ratio in the entire district is not even across the district.

- During the course of the analysis, it has been found that some of the CD Blocks were recurrently showing poor condition of health services. In terms of the availability of health institutions, health personnel, doctors and beds against the

area and the population of the CD Blocks, it was found that Socheng CD Block fared poorly in all counts. On the other hand, Socheng, Nilip including Rongmongve and to some extent, Romgkhang and Amri CD Blocks have showed the need for further improvements of health services in terms of area coverage.

- During the analysis, it also found that, the existing number of health facilities does not correspond at all to the number of settlements of the district. Amongst the CD Blocks, the locational intensity, the highest numbers of facilities have been observed in Rongkhang CD Block, while the least figure of facilities have been seen in Nilip CD Block.

- In case of population coverage, it was found that, Socheng, Romgkhang and Bokajan CD Blocks have showed health manpower and infrastructure are not adequate for the given population. On the other, Chinthong and Lumbajong Blocks have showed better condition of health services.

- Incidentally, Hamren, the Head Quarter of West Karbi Anglong located in Chinthong CD Block and Diphu, the Head Quarter of Karbi Anglong District located in Lumbajong CD Block where the only two Civil Hospitals of the region are also located may have contributed to better health services in these two CD Blocks. Looking into the specific poor health services conditions in Socheng CD Block, it can be observed that from 2011 to 2019, there has been only marginal improvement on the health services front. High Scheduled Tribes (ST) and rural population, low literacy rate and substantial cultivating population add another dimension to the condition of health services in Socheng CD Block. On the contrary, however, these medical facilities as a Sub centres are also found available in a settlement having a minimum population of less than 100 persons.

- In the district other facilities especially the road and communication facilities and services are quite meager being confined to urban centres or town areas only. The district also experiences a National High Way as well as State High Ways and a moderate level of roads connected all over the district. But the overall road conditions in the entire district are not up to that satisfactory level. Even the rail way lines (Broad Gauge) which runs through the heart of the district Head Quarter shows a low intensity of facilities.

- The distribution of transport net work and the road accessibilities shows that, no facilities are available in the remotest rural areas of the district. Very recently however the renovation works of roads especially in and around Diphu municipality/ urban area have been done and other parts of the region are under progress.

- There seems a change in the functional structure of various orders of facilities. The high order service centre i.e. Diphu having 87 no. of facilities (only one in the district), performs all the facilities related to socio-economic set up, with their high intensities, while, medium order service centres are found to be changing their functional structure (**Fig 1.18**). Even the Third and Fourth (low & very low order) order service centres are changing in their functional structure as well as in the number of facilities/ functions.

- The analysis of functional hierarchy shows that there exist a total of 4 hierarchic orders of the centres in the district. The highest order service centre, i.e. Diphu urban centre the Head Quarter of the district possesses 6858.74 as the composite centrality scores (**Appendix-I**). Similarly**,** in the second order service centres there lie 2 centres out of the total 221 number of centres, namely Bokajan (4525.51) and Baithalangso (4425.76). The third order service centres are of medium order service centres attaining its centrality score of more than 3000 as the composite centrality scores in two centres and between 1500 – 2500 as their composite centrality scores in the other two centres. While, the fourth order i.e. the very low order emerging nodal centres possesses their centrality score of less than 1000 bearing a few service centres which attains more than 1000 as their composite scores.

- The study therefore clearly shows that, the distributional patterns of spatio-functional facilities are not uniform despite of most richly and densely distributed resources in the district. As a result, the functional facilities are more concentrated on a few locations and are not optimal according to the norms of given by the Planning Commission.

- By plotting the centrality scores and population against their ranks, it is understood that the lower order hierarchic centres are not proportionately emerging out as compared to the high order service centres.

SUGGESTIONS

After interpreting the salient features of spatio-functional facilities/patterns and the initial findings of the present study as described above, a few but important Suggestions and Conclusion can be drawn successfully which are described in the following pages.

The district Karbi Anglong is richly endowed with natural resources. It is clearly observed from the present study that, the resources structure of the area in particular has played an utmost importance in the distribution of functions and facilities of education and health in the district.

Though now gradually the rate of literacy is increasing day by day, yet the district is lagging behind in comparison with other districts in the state. At present, comparatively, the literacy rate in rural areas is much lower than urban areas in the district. As a consequent of this fact, the present rate of literacy in the district calls for urgent steps to be taken and implemented by the concerned authorities

It is also being observed that the distributions of these facilities and functions are concentrated only on a few locations and hence, the functional patterns are not to that normative condition of resource availability.

In fact, there are functional gaps in the distribution of existing number of educational as well as health facilities from one location or centre to the other compared to the population size and the demand of the people in the district and consequently, only a few locations in the district seems to be is better facilitated. The district also has a good number of higher educational institutions.

Looking at the uneven distribution of the number of educational institutions in the entire district, it is clearly found that there is a wide gap in the distribution of existing number of educational facilities compared to the population size and the demand of the people in the district.

The study further reveals that, the uneven distribution of educational facilities needs to be properly identified and implemented for the benefit of the student community living in this hill district.

To meet the needs of the developing society, higher education in any region should be given much importance. Therefore, the need of the hour is to expand the number of education facilities in its fullest capacity by the concerned authorities by adopting qualitative measures for the greater interest of the people in the district.

In terms of distribution of educational facilities as the Table No. 3.3, 3.3(a) & 3.4 shows, there is a need for establishment of large number of middle schools followed by High Schools/Higher Secondary Schools compared to its geographical area and the size of population in the district.

The present numbers of Higher Secondary Schools in the district is not sufficient for the population size and needs of the people of the district. Moreover, it is found from the study that, there are gaps in the distributions of these institutions as per the demand of the people in the region.

Looking into the insufficient number of the Higher Secondary Schools and its location/distributional position, more number of Higher Secondary institutions in the district may be established for the benefit of the people of the entire region.

It is also observed that, the number of institutions for Higher education is very low in the study area. There are only few Higher Secondary Schools and Degree Colleges. The existing number of higher educational institutions as compared to the student population is insufficient and need to be increased.

Moreover, the number of Degree colleges having Science streams need to be increased by adopting positive measures for the benefit of the student community and the greater interest of the people in the district.

Therefore, there is an urgent need to check the infrastructural facilities available in the institutions in the entire district.

During the Primary survey (Field survey), it was found that, educational institutions in rural areas are mostly found to be accompanied by higher teacher-students

ratio, poor communication facilities, poor infrastructure facilities and higher rate of school dropout, located in the remote areas and problem of drinking water facilities etc.

At the same time, it was also found that, there is a problem of drinking water facilities; lack of infrastructural facilities and inadequate workforce in most of the health sub centres in the district.

Further, it was also observed that, out of the total of 34 health centres surveyed, most of the health centres are rural in nature except CHC, BPHCs and MPHCs and are located in the rural areas at a distance of about 283 km (Umswai SC) from the Head Quarters (**Appendix-III**). The numbers of villages covered by these health centres are found to be maximum of 100 villages in Choukihola BPHC (Nilip CD Block) and Donkamokam CHC with 187 villages (Rongkhang CD Block).

In case of the 22 numbers of educational institutions surveyed covering almost all the CD Blocks, all the institutions barring a few have showed Arts streams as their course of study in the institution.

However, out of the 24 villages surveyed, Karbi tribes are found to be major tribes/ inhabitants in almost all the villages surveyed. During the course of survey, it was observed that most of the family living in the villages is economically poor and daily wage laborers. Many villages surveyed are even found to be located at a distance of 20 to 40 km away from the main towns.

It is therefore observed from the, data of (**Appendix-III**) Primary Survey (Field survey) that, the village located in remote areas is deprived of getting better facilities as compared to those villages which are located near the urban location. Even the distributions of infrastructure facilities in these institutions/centres are of dispersed in nature.

In most of the educational institutions and health centres surveyed, it is observed that, there are inadequate educational and health infrastructure and workforce. Therefore, there is an urgent need to check the infrastructural facilities available in these educational institutions and health centres by the concerned authorities and provide the infrastructure facilities that are required for the proper functioning of the institutions.

The existing number of Health facilities in the district seems to be highly inadequate compared to the requirements and demand of the people living in the rural areas. The gap between existing facilities and the requirement is phenomenal particularly for the maternity and child welfare unit as well the family planning centres.

The hospitals and other community health centres, sub centres and dispensaries need to be established for the welfare of the society as a whole.

The study reveals that the number of health institutions, health personnel, doctors and beds need to be increased in Karbi Anglong District. Further, the present study reveals that health facilities are concentrated in only some few CD Blocks, whereas, the rest of the CD Blocks in Karbi Anglong district of Assam are plagued by inadequate health infrastructure and workforce.

Under such situation, therefore, there is a need of describing the locational patterns of functional facilities and centrality patterns in its spatial set up and socio-economic conditions for overall development of the area. In fact, the whole systems of process of development in the district should be changed in order to avail these existing facilities/activities in orderly manner.

It is highly noticeable that the road communication for instance, is not at all developing in the entire district except the urban areas, National High way and State Highways.

No good roads connectivity for example Umlapher, Ulukunchi, Umpanai, Rongjanphong and Zirikindeng areas in West Karbi Anglong is available so far (**plate: 54, 55, 62 & 63**). At the existing level, the facilities of cutcha road are fairly distributed, but the district is poorly served by pucca roads. The conversion of cutcha roads to pucca roads especially in the remote village areas to move and travel to town areas would be an important for the development of the district. Therefore, much attention should be given for having proper transport and communication system in the remote areas in the district.

Scarcity of drinking water in most of the areas is a great problem for which people in general especially in the remote upland areas mostly depends on the supply of the natural sources, such as river, streams and streamlets etc.

The district HQ, Thana HQ, Block HQ is however, seems to be fairly distributed with the facilities that are required.

From the present study, it is also felt necessary that, for the proper functioning of the educational institutions, every educational institution should be provided with teachers' common room facilities. Pure drinking water facilities, toilet facilities both for boys and girls students separately should also be compulsorily provided.

The present study further reveals that, most of the areas in the district are found to be segregated by dense forest cover, hilly terrain, rivers and streams etc where there lie serious problems of road transportation and communication facilities. Establishment of both educational institutions and health centres therefore becomes difficult task in such remote and hilly terrain areas.

CONCLUSION

Education is the driving force for any development in human society. The development of providing quality education needs to be flourished. The improvement in education will bring the improvement in economic and social status among the people, especially the hill tribes living in the district.

From the foregoing analysis it can be concluded that there are certain major problems and issues with primary, secondary and higher secondary education in Karbi Anglong which are to be solved for further development. The study showed that the first and foremost problem of Karbi Anglong district is shortage of educational institutions in remote and hilly areas. People from one area/village find difficult to move to other area/village or locality for attending school due to physical barriers like hilly terrain, rivers and streams, dense forest etc. Moreover, there are acute means of transportation problem in these villages or localities. Population is also found to be very less in some villages comparatively where opening of a new educational institution is a problem itself.

In the present study out of 1977 Primary Schools (2016) institutions, 1870 are in rural areas and only 107are in urban areas. In fact, there is no sufficient number of primary, secondary and higher educational institutions in rural areas of the district. At the same time, the infrastructure facilities and material conditions of the institutions of the rural areas are worse than those of urban areas. Most of these schools don't have separate

class room, toilet facilities, pure drinking water facilities, power supply connectivity, sufficient furniture, play ground etc.

For developing and spreading education, it is necessary to establish educational institutions within a short distance. The library condition in the educational institutions, especially in the higher secondary schools and colleges should be improved and upgraded by providing with better facilities like, internet Wi-Fi systems etc.

The Secondary school should also be well equipped with proper reading materials like up-to-date reference books, journals, news paper etc. In most of the Higher secondary schools and colleges vocational courses may be introduced. The authority concerned may take proper initiatives for introducing vocational courses in the educational institutions which would help students for their self employment. The local authorities may also recruit teachers for these courses.

Career counseling center may also be opened especially in higher secondary schools and college for the betterment of the students. Moreover, Karbi Anglong district is a tribal dominated area and most of its people are very poor thereby the students' drop outs rate is high.

To minimize the rate of drop outs the authority concerned may provide various facilities to the poor but meritorious students for pursuing their studies further.

Therefore, there is urgent need of establishing better educational institutions in the district besides broad minded people, alert citizens and nongovernmental organizations must collaborate to improve the conditions of education in the district. The district administration also has to implement all available schemes and programmes for the development of the education. The most important is awareness among the people and the people need to be educated towards the benefit of education.

The study also reveals that all the colleges of the present study are mostly arts stream dominated. It is noticed that, there is least importance on education of science and management in the district. This is the age of science and technology; knowledge of science is closely connected with the progress and development of the society and its people. Moreover, it is known fact that without the knowledge of management people cannot cope up with the present situation.

Therefore it is suggested that, importance should be given on the development of science and commerce streams. At the same time the state government should also come forward and take initiatives for the development of education in this tribal dominated hill district.

Besides these above observations and findings of education institutions, the study further reveals that the number of health institutions, health personnel, doctors and beds need to be increased in the district. As per the study, it shows that there has been marginal improvement in health services in 2019 as compared to 2011.

However, these facilities are concentrated in only some few CD Blocks and are mostly in the urban areas. Leaving aside some of the CD Blocks with better health services, the present study reveals that rest of the CD Blocks in the district are plagued by inadequate health infrastructure and workforce.

However, on closer look, it was found that these disadvantaged CD Blocks do not have similar physical and human conditions. In fact, CD Blocks which are located in plain areas and possess high density of population have better health facilities than the other groups of CD Blocks.

It was observed that although they had decent infrastructure and manpower compared to the other group of CD Blocks, such facilities were inadequate for them given their larger population size.

More than anything else, the study reveals that the distribution of health care facilities/ services in the study area is a reflection of the physical and human condition. An in-depth study incorporating these factors would surely bring out the nuances of the interaction between physical and human factors in understanding the distribution of health (Medical) facilities of Karbi Anglong in particular and Assam in general. It has been observed that such understanding has rarely made it to the planning and decision-making processes in the region. The incorporation of which will go a long way in improving the quality and the reach of healthcare services in the region.

In conclusion it can be said that the spatio functional facilities in the district is not uniform and ubiquitous in their distribution and it registers a wide variations in the phenomenon of functional distribution of facilities. It further determines that the district requires more facilities/amenities to obtain an optimal spatio functional facility of these

facilities described in the study area. In the end, it can be said that, the study reflects only the spatio-functional facilities/ patterns of these facilities of the district. The research can be extended towards the locational decision making processes in the extended for preparing the optimal spatio-functional organization of the district in a broader way.

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APPENDICES

APPENDIX- I

CENTRALITY SCORES

Sl. Nos.	Village Code	Name of Village	CD Blocks	Population	Number of facilities/ amenities (2011)	Centrality Scores (2011)
1	295294	Amguri	**Amri**	468	4	58.92
2	295312	Langerdang	Amri	420	3	36.07
3	295313	Phutsari	Amri	635	4	37.57
4	295316	Umswai	Amri	475	4	109.37
5	295319	Chidamakha	Amri	595	3	216.73
6	295340	Birsingki	Amri	865	3	81.41
7	295341	Umsamukh	Amri	634	2	74.80
8	295345	Ullukuachi	Amri	649	3	36.07
9	295366	Borgaon	Amri	765	5	127.52
10	295369	Balikunchi-2	Amri	135	2	302.83
11	295370	Dalimbari	Amri	1102	11	361.37
12	295371	Sinai Nadi	Amri	555	2	248.05
13	295372	Voksong(Ghelapata)	Amri	1421	7	1155.30
14	295398	Tengkeralangso-1	Amri	1322	7	47.18
15	295432	Amtereng	Amri	478	3	36.07
16	295436	Umpani Chistian	Amri	1245	5	160.59
17	295852	Tamulbari RF	Amri	1943	5	17.72
18	296011	Dilawjan Koch Gaon	**Bokajan**	445	2	74.80
19	296024	Senso Bey	Bokajan	358	2	74.80
20	296041	Neparpeti Kachari Gaon	Bokajan	280	3	81.81
21	296080	Tal Balijan 1,2	Bokajan	1071	4	16.22
22	296127	Dilai Bazar	Bokajan	329	7	473.83
23	296130	Borlengri	Bokajan	2180	4	16.22
24	296166	Gurial Dubi 1,2,3	Bokajan	817	3	36.07
25	296168	Khat Khati Pacca Field	Bokajan	1606	3	14.72
26	296169	Khat Khati Tila Bosti	Bokajan	3195	5	22.83
27	296228	Langsangti	Bokajan	282	1	73.30
28	296286	Khotkhoti Bazar	Bokajan	2608	3	238.08
29	296309	Lokhijan Gaon	Bokajan	455	3	9.61
30	296405	Kamola Bagan	Bokajan	161	1	301.33
31	297809	Sardoka Engti	Bokajan	1082	3	248.05
32	297814	Hallo Khuwa	Bokajan	2098	4	16.22
33	297816	Bar Pathar	Bokajan	1038	3	14.72
34	297819	Barsewaguri	Bokajan	1149	4	42.68
35	297823	Japarajan	Bokajan	2052	5	22.83
36	297824	Jabarajan	Bokajan	1886	3	14.72
37	298204	Dhansiri T.E	Bokajan	82	3	14.72
38	295416	Sucha	**Chinthong**	387	3	36.07
39	295421	Maisam	Chinthong	1735	5	17.72
40	295422	Eden Bari	Chinthong	335	3	36.07
41	295673	Mokoiram	Chinthong	247	2	74.80
42	295754	Dikisir	Chinthong	297	2	74.80

43	295762	Wodilangso	Chinthong	166	2	119.41
44	295785	Umru Laru	Chinthong	1061	3	14.72
45	295787	Umlapher	Chinthong	2020	4	42.68
46	295796	Umwang	Chinthong	1371	5	44.18
47	295822	Rongchek	Chinthong	661	3	36.07
48	296740	Sankar Gaon	**Howraghat**	423	3	14.72
49	296749	Ka-Uri Pathar	Howraghat	655	3	9.61
50	296757	Maji Gaon	Howraghat	408	3	9.61
51	296760	Cherakani	Howraghat	523	3	912.11
52	296769	Sildharampur	Howraghat	602	4	37.57
53	296779	Kajesera No.1	Howraghat	500	3	36.07
54	296780	Kajesera No.2	Howraghat	481	3	36.07
55	296793	Uttar Borbil Reng Reng Jhara	Howraghat	529	3	36.07
56	296805	Kaje Sera Mati Khula	Howraghat	461	3	36.07
57	296812	Pudum Pukhuri No.2	Howraghat	322	3	36.07
58	296828	Uttar Borbil No. 2	Howraghat	1461	5	117.91
59	296830	Uttar Borbil Block 1, 2	Howraghat	1329	3	14.72
60	296839	Rongkut Block No.4	Howraghat	1368	4	132.63
61	296846	Sital Mari	Howraghat	1278	4	132.63
62	296847	Samaguri No.3 Block 1,2	Howraghat	1160	5	115.98
63	296853	Toupura	Howraghat	1153	3	9.61
64	296856	Barbil Gaon	Howraghat	706	3	36.07
65	296863	Cherop Tokbi	Howraghat	337	3	36.07
66	296894	Okreng Pathar	Howraghat	398	3	36.07
67	296899	Hatiparameteka Block 1,2	Howraghat	1799	5	134.13
68	296911	Pan Engti Gaon	Howraghat	569	3	9.61
69	296915	Karkok Bey Gaon	Howraghat	311	4	256.16
70	296916	Kachupukhuri 1,2	Howraghat	626	3	14.72
71	296918	Mirdo Pathar	Howraghat	647	3	14.72
72	296919	Bomrui	Howraghat	538	3	14.72
73	296939	Molesh Bosti	Howraghat	794	2	74.80
74	296950	Temikhula	Howraghat	464	2	74.80
75	296951	Tin-Ali Lalung	Howraghat	289	3	14.72
76	296952	Rajapathar Tin-Ali	Howraghat	251	3	14.72
77	296954	Lon Sekjan Block 1,2	Howraghat	911	3	192.71
78	296957	Pub-Silputa	Howraghat	640	3	9.61
79	296991	Engleng Gaon (Thipok Engleng)	Howraghat	436	3	36.07
80	297021	Nam Bokulia 1,2	Howraghat	1225	4	132.63
81	297062	Nijdeng Gaon	Howraghat	361	4	153.98
82	297114	Borbil Amoni	Howraghat	593	4	42.68
83	297401	Pub Silputa Chowhan	Howraghat	915	4	37.57
84	297741	Ampukhuri Garo Gaon	Howraghat	141	3	30.96
85	295880	Jusep Basti	**Lumbajong**	352	3	36.07
86	295887	Dhanshri Bazar	Lumbajong	726	4	153.98
87	295889	Dhanshri Linapar	Lumbajong	790	3	36.07
88	295890	Bhta Gaon	Lumbajong	1073	2	74.80
89	295892	Khangkraidisa	Lumbajong	205	2	74.80

90	295893	Kherbari	Lumbajong	453	2	74.80
91	295904	Shiv Nagar Christian Basti	Lumbajong	148	3	30.96
92	295922	Hemari Bey	Lumbajong	185	4	16.22
93	295933	Barlangfer Rly Station	Lumbajong	316	4	254.66
94	295960	Hojaipur	Lumbajong	310	3	686.11
95	295980	Manja East	Lumbajong	2585	14	759.70
96	295981	Manja West	Lumbajong	1893	14	759.70
97	296154	Longnit Bazar	Lumbajong	638	4	14.72
98	296199	Mohong Diza	Lumbajong	144	2	74.80
99	296455	Rongplimplam Bazar	Lumbajong	54	3	14.72
100	296556	Raijaudisa	Lumbajong	112	2	74.80
101	296560	Langsoliet Natun Bazar	Lumbajong	700	3	36.07
102	296568	Lobongfa Nala	Lumbajong	383	3	81.41
103	296720	Matipung R.F.	Lumbajong	2294	4	16.22
104	296724	Central Range Manja	Lumbajong	1509	4	11.11
105	296730	Singhashan R.F.	Lumbajong	1327	5	22.83
106	297889	Bhitar Kalioni(Merabheti)	**Nilip**	795	3	36.07
107	297927	Bongso Tisso(Longhop Tisso)	Nilip	515	3	36.07
108	297937	Kidu Bey	Nilip	185	3	14.72
109	297942	Longhup Teron	Nilip	766	3	36.07
110	297946	Langsomepi	Nilip	101	2	74.80
111	297981	Sarmen Tisso	Nilip	227	3	14.72
112	298008	Safapani	Nilip	451	3	14.72
113	298048	Bepari	Nilip	230	3	14.72
114	298067	Dakhara Hide Bey	Nilip	821	5	65.53
115	298164	Sonsiram Terang	Nilip	131	3	14.72
116	295449	**Baithalangso**	**Rongkhang**	**1987**	**17**	**4425.76**
117	295451	Tika	Rongkhang	1043	5	946.68
118	295467	Hongkram	Rongkhang	1201	7	233.89
119	295468	Hongkram Adarsha	Rongkhang	1364	7	208.93
120	295470	Lutumari	Rongkhang	379	3	36.07
121	295471	Rupachithi	Rongkhang	513	3	36.07
122	295472	Serlongchor	Rongkhang	902	3	81.41
123	295479	Langmepi	Rongkhang	2587	5	44.18
124	295491	Thepli Aram	Rongkhang	521	3	36.07
125	295492	Harlong Sora	Rongkhang	683	3	9.61
126	295493	Jengkha	Rongkhang	2341	7	117.48
127	295503	Rikang Mehom	Rongkhang	715	2	74.80
128	295504	Phelangpi	Rongkhang	1033	3	9.61
129	295506	Sarumatikhula	Rongkhang	1895	4	42.68
130	295508	Kheroni	Rongkhang	1384	7	168.7
131	295510	Arnam Anglong (Kheroni)	Rongkhang	1481	3	14.72
132	295512	Kheroni Nepali Pgr.	Rongkhang	1504	3	14.72
133	295513	Kheroni Kachari Pgr.	Rongkhang	1782	8	48.68
134	295515	Bagisadubi	Rongkhang	2126	5	22.83
135	295516	Doyangmukh	Rongkhang	2998	4	42.68

136	295517	Radhanagar	Rongkhang	1157	4	21.33
137	295519	Deklem	Rongkhang	1531	7	78.75
138	295520	Lamsakham	Rongkhang	1017	3	14.72
139	295521	Nawaibil	Rongkhang	7303	9	705.33
140	295523	Mailoo Bl No.4	Rongkhang	3700	6	24.33
141	295525	Belbari	Rongkhang	3153	8	53.79
142	295527	Majiahadi	Rongkhang	1033	3	14.72
143	295528	Jiribasa	Rongkhang	1358	6	24.33
144	295529	Mosoka	Rongkhang	1133	3	14.72
145	295530	Guha Gaon	Rongkhang	1041	3	14.72
146	295532	Hajagapher	Rongkhang	1437	6	72.14
147	295533	Hawaipur	Rongkhang	1048	5	70.64
148	295534	Watijur No.2 Bl	Rongkhang	2574	8	32.44
149	295536	Lambapathar	Rongkhang	2565	6	19.22
150	295538	Deklem	Rongkhang	1953	6	50.79
151	295540	Maimaru Das Basti	Rongkhang	573	3	9.61
152	295542	Dekreng Pgr.	Rongkhang	834	3	14.72
153	295548	Chera Pathar	Rongkhang	1725	8	32.44
154	295549	Cheng-Cheng Bil	Rongkhang	1248	3	14.72
155	295553	Englong Parpan	Rongkhang	925	5	246.19
156	295556	Menmeji	Rongkhang	1629	4	16.22
157	295557	Mukhim	Rongkhang	732	4	16.22
158	295558	Lalmati	Rongkhang	622	3	36.07
159	295575	Karbi Rongsopi-1	Rongkhang	779	3	9.61
160	295589	Kuthepi Nepali Gaon	Rongkhang	1119	3	14.72
161	295597	Mugasong	Rongkhang	1600	6	45.68
162	295598	Tumpreng Bazar	Rongkhang	237	4	290.03
163	295599	Tumpreng	Rongkhang	226	4	290.03
164	295602	Upper Taradubi	Rongkhang	1536	6	279.26
165	295603	Namtaradubi	Rongkhang	1804	7	25.83
166	295604	Bhelapara	Rongkhang	1315	4	16.22
167	295605	Sat Gaon	Rongkhang	2535	4	16.22
168	295606	Satgaon Bazar	Rongkhang	1361	6	29.44
169	295609	Rongkuroi	Rongkhang	1691	5	17.72
170	295610	Rongjamir	Rongkhang	371	3	9.61
171	295616	Bogori Gaon	Rongkhang	1011	3	14.72
172	295618	Hanlokrok	Rongkhang	955	6	138.83
173	295622	Tengkeralangso	Rongkhang	1348	4	37.57
174	295641	Kolising Gaon	Rongkhang	1027	4	16.22
175	295643	Angpong Gaon	Rongkhang	535	3	9.61
176	295646	Bali Gaon	Rongkhang	517	4	244.69
177	295855	Rongkhana R.F.	Rongkhang	5848	7	702.33
178	295858	Bithung R.F.	Rongkhang	2701	5	12.61
179	297234	Parkup Pahar No.1	**Rongmongwe**	84	2	74.80
180	297235	Ti Langso Gaon	Rongmongwe	177	1	73.30
181	297236	Parkup Pahar No.2	Rongmongwe	167	2	74.80
182	297515	Dokai Bey (Longki Bey)	Rongmongwe	417	2	248.05
183	297744	Engchin Langso	Rongmongwe	106	1	301.33
184	298099	Chondro Sing Rongpi	Rongmongwe	562	3	36.07
185	297047	Panjuri Adai Hanse	**Samelangso**	274	3	9.61

186	297058	Bhaluk Jan	Samelangso	683	2	119.41
187	297063	Den Gaon Christian	Samelangso	425	3	36.07
188	297066	Den Gaon No.2	Samelangso	79	3	119.41
189	297068	Kangnek Tokbi	Samelangso	392	3	36.07
190	297160	Jasiguri No.2	Samelangso	432	3	9.61
191	297166	Dongka Chingthu-3	Samelangso	479	3	9.61
192	297167	No.3 Jasiguri	Samelangso	368	3	9.61
193	297187	Dongkarmukh Gaon	Samelangso	789	3	9.61
194	297188	Hari Ronghang	Samelangso	352	3	9.61
195	297194	Manikpur	Samelangso	407	3	36.07
196	297209	Etpo Taro	Samelangso	483	2	8.11
197	297221	Bhim Teron and Langtuk Taro	Samelangso	325	3	9.61
198	297395	Langhin Bazar Bl.1	Samelangso	947	7	482.77
199	297450	Dhupguri No.2	Samelangso	170	3	237.32
200	297453	Tila Para No.1	Samelangso	131	1	301.33
201	297474	Sarso Bey Gaon	Samelangso	303	2	302.83
202	297475	Samelangso Terang (Bazar area)	Samelangso	344	3	36.07
203	297485	Poisa Engti	Samelangso	326	2	302.83
204	297753	Thekelangjun Bazar	Samelangso	163	3	1430.80
205	297773	Angjok Tokbi	Samelangso	116	1	301.33
206	295677	Umpaweng (Langhemphi)	**Socheng**	703	3	9.61
207	295684	Rongpangbong	Socheng	1241	4	16.22
208	295715	Jyrykyndeng	Socheng	1544	5	289.23
209	297243	Ati Gaon	**Langsomep**i	893	3	14.72
210	297305	Balijan Bazar Bosti	Langsomepi	1872	5	134.13
211	297353	Samoguri	Langsomepi	214	2	74.80
212	297396	Kur kut Bosti	Langsomepi	356	3	36.07
213	297430	Bey Engti Village	Langsomepi	237	2	302.83
214	297437	No.2 Jaipur	Langsomepi	201	2	119.41
215	801604	**Hamren (TC)**	**Chinthong**	**8747**	**29**	**3690.92**
216	801605	**Donkamokam (TC)**	**Rongkhang**	**9116**	**19**	**2303. 47**
217	801606	**Diphu (TC)**	**Lumbajong**	**61797**	**87**	**6858.74**
218	801607	**Bokajan (TC)**	**Bokajan**	**19877**	**47**	**4525.51**
219	296732	Laharijan Natun Bosti (CT	Bokajan	2508	0	0
220	801608	**Howraghat (TC)**	**Howraghat**	**5443**	**17**	**3484.70**
221	801609	**Dokmoka (TC)**	**Samelangso**	**5478**	**14**	**1645.93**
	TOTAL				**1041**	

Source: Researcher's Personal computation

APPENDIX - II

Sl. Nos.	Village Code	Name of the Village	CD Blocks	Population	No. and Nature of facilities	No. of the Facilities available
1	295294	Amguri	**Amri**	468	PS-2,SS/HS-2	4
2	295312	Langerdang	Amri	420	PS,MS,SS/HS	3
3	295313	Phutsari	Amri	635	PS-2,MS,SS/HS	4
4	295316	Umswai	Amri	475	PS,MS,SS/HS,PHC	4
5	295319	Chidamakha	Amri	595	PS,MS,HSS	3
6	295340	Birsingki	Amri	865	PS,MS,PHSC	3
7	295341	Umsamukh	Amri	634	PS,PHSC	2
8	295345	Ullukuachi	Amri	649	PS,MS,SS/HS	3
9	295366	Borgaon	Amri	765	PS-2,MS,PHC,VET	5
10	295369	Balikunchi-2	Amri	135	PS,OTHERS	2
11	295370	Dalimbari	Amri	1102	PS-3,MS-4,SS/HS-3 SD	11
12	295371	Sinai Nadi	Amri	555	PS,SD	2
13	295372	Voksong(Ghelapata)	Amri	1421	PS,MS-2,SS/HS,HSS, CHC, VET	7
14	295398	Tengkeralangso-1	Amri	1322	PS-4,MS-2,SS/HS	7
15	295432	Amtereng	Amri	478	PS,MS,SS/HS	3
16	295436	Umpani Chistian	Amri	1245	PS,MS-2,SS/HS,PHC	5
17	295852	Tamulbari RF	Amri	1943	PS-3,MS-2	5
18	296011	Dilawjan Koch gaon	**Bokajan**	445	PS,PHSC	2
19	296024	Senso Bey	Bokajan	358	PS,PHSC	2
20	296041	Neparpeti Kachari Gaon	Bokajan	280	PS,MS,PHSC	3
21	296080	Tal Balijan 1,2	Bokajan	1071	PS-2,MS-2	4
22	296127	Dilai Bazar	Bokajan	329	PS,MS,SS/HS,PHC, PHSC,SD,VET	7
23	296130	Borlengri	Bokajan	2180	PS-2.MS-2	4
24	296166	Gurial Dubi1,2,3	Bokajan	817	PS,MS,SS/HS	3
25	296168	Khat Khati Pacca Field	Bokajan	1606	PS,MS-2,	3
26	296169	Khat Khati Tila Bosti	Bokajan	3195	PS-2,MS-3	5
27	296228	Langsangti	Bokajan	282	PHSC	1
28	296286	Khotkhoti Bazar	Bokajan	2608	PS,SS/HS,HSS	3
29	296309	Lokhijan Gaon	Bokajan	455	PS-2,MS,	3
30	296405	Kamola Bagan	Bokajan	161	OTHERS	1
31	297809	Sardoka Engti	Bokajan	1082	PS,SD,VET	3
32	297814	Hallo Khuwa	Bokajan	2098	PS-2,MS-2	4
33	297816	Bar Pathar	Bokajan	1038	PS,MS-2	3
34	297819	Barsewaguri	Bokajan	1149	PS,MS-2,SS/HS	4
35	297823	Japarajan	Bokajan	2052	PS-2,MS-3	5
36	297824	Jabarajan	Bokajan	1886	PS,MS-2	3
37	298204	Dhansiri T.E	Bokajan	82	PS,MS-2	3
38	295416	Sucha	**Chinthong**	387	PS,MS,SS/HS	3
39	295421	Maisam	Chinthong	1735	PS-3,MS-2	5
40	295422	Eden Bari	Chinthong	335	PS,MS,SS/HS	3
41	295673	Mokoiram	Chinthong	247	PS,PHSC	2

42	295754	Dikisir	Chinthong	297	PS,PHSC	2
43	295762	Wodilangso	Chinthong	166	PS,PHC	2
44	295785	Umru Laru	Chinthong	1061	PS,MS-2	3
45	295787	Umlapher	Chinthong	2020	PS,MS-2,SS/HS	4
46	295796	Umwang	Chinthong	1371	PS-2,MS-2,SS/HS	5
47	295822	Rongchek	Chinthong	661	PS,MS,SS/HS	3
48	296740	Sankar Gaon	**Howraghat**	423	PS,MS-2	3
49	296749	Ka-Uri Pathar	Howraghat	655	PS-2,MS	3
50	296757	Maji Gaon	Howraghat	408	PS-2,MS	3
51	296760	Cherakani	Howraghat	523	PS,MS,JC/C	3
52	296769	Sildharampur	Howraghat	602	PS-2,MS,SS/HS	4
53	296779	Kajesera No.1	Howraghat	500	PS,MS,SS/HS	3
54	296780	Kajesera No.2	Howraghat	481	PS,MS,SS/HS	3
55	296793	Uttar Borbil Reng Reng Jhara	Howraghat	529	PS,MS,SS/HS	3
56	296805	Kaje Sera Mati Khula	Howraghat	461	PS,MS,SS/HS	3
57	296812	Pudum Pukhuri No.2	Howraghat	322	PS,MS,SS/HS	3
58	296828	Uttar Borbil No.2	Howraghat	1461	PS-2,MS-2PHC	5
59	296830	Uttar Borbil Block 1, 2	Howraghat	1329	PS,MS-2	3
60	296839	Rongkut Block No.4	Howraghat	1368	PS,MS-2,PHC	4
61	296846	Sital Mari	Howraghat	1278	PS,MS-2,PHC	4
62	296847	Samaguri No.3 Block 1,2	Howraghat	1160	PS,MS-2,SS/HS, PHSC	5
63	296853	Toupura	Howraghat	1153	PS-2,MS	3
64	296856	Barbil Gaon	Howraghat	706	PS,MS,SS/HS	3
65	296863	Cherop Tokbi	Howraghat	337	PS,MS,SS/HS	3
66	296894	Okreng Pathar	Howraghat	398	PS,MS,SS/HS	3
67	296899	Hatiparameteka Block 1,2	Howraghat	1799	PS-2,MS-2,PHC	5
68	296911	Pan Engti Gaon	Howraghat	569	PS-2,MS	3
69	296915	Karkok Bey gaon	Howraghat	311	PS-2,MS,SD	4
70	296916	Kachupukhuri 1,2	Howraghat	626	PS,MS-2	3
71	296918	Mirdo Pathar	Howraghat	647	PS,MS-2	3
72	296919	Bomrui	Howraghat	538	PS,MS-2	3
73	296939	Molesh Bosti	Howraghat	794	PS,PHSC	2
74	296950	Temikhula	Howraghat	464	PS,PHSC	2
75	296951	Tin-Ali Lalung	Howraghat	289	PS,MS-2	3
76	296952	Rajapathar Tin Ali	Howraghat	251	PS,MS-2	3
77	296954	Lon Sekjan Block 1,2	Howraghat	911	PS,PHC,PHSC	3
78	296957	Pub-Silputa	Howraghat	640	PS-2,MS,	3
79	296991	Engleng Gaon (Thipok Engleng)	Howraghat	436	PS,MS,SS/HS	3
80	297021	Nam Bokulia 1,2	Howraghat	1225	PS,MS-2,PHC	4
81	297062	Nijdeng Gaon	Howraghat	361	PS,MS,SS/HS,PHC	4
82	297114	Borbil Amoni	Howraghat	593	PS,MS-2,SS/HS	4
83	297401	Pub Silputa Chowhan	Howraghat	915	PS-2,MS,SS/HS	4
	297741	Ampukhuri Garo	Howraghat	141		3

84		Gaon			PS-2,SS/HS	
85	295880	Jusep Basti	**Lumbajong**	352	PS,MS,SS/HS	3
86	295887	Dhanshri Bazar	Lumbajong	726	PS,MS,SS/HS,PHC	4
87	295889	Dhanshri Linepar	Lumbajong	790	PS,MS,SS/HS	3
88	295890	Bhta Gaon	Lumbajong	1073	PS,PHSC	2
89	295892	Khangkraidisa	Lumbajong	205	PS,PHSC	2
90	295893	Kherbari	Lumbajong	453	PS,PHSC	2
91	295904	Shiv Nagar Christian Basti	Lumbajong	148	PS-2,SS/HS	3
92	295922	Hemari Bey	Lumbajong	185	PS-2,MS-2	4
93	295933	Barlangfer Rly Station	Lumbajong	316	PS,MS,SD,VET	4
94	295960	Hojaipur	Lumbajong	310	PS,MS,FWC	3
95	295980	Manja East	Lumbajong	2585	PS-2,MS-4,SS/HS-3 HSS,PHC,PHSC, SD,VET	14
96	295981	Manja West	Lumbajong	1893	PS-2,MS-4,SS/HS-3 HSS,PHC,PHSC, SD,VET	14
97	296154	Longnit Bazar	Lumbajong	638	PS,MS-2,VET	4
98	296199	Mohong Diza	Lumbajong	144	PS,PHSC	2
99	296455	Rongplimplam Bazar	Lumbajong	54	PS,MS-2,	3
100	296556	Raijaudisa	Lumbajong	112	PS,PHSC,	2
101	296560	Langsoliet Natun Bazar	Lumbajong	700	PS,MS,SS/HS	3
102	296568	Lobongfa Nala	Lumbajong	383	PS,MS,PHSC	3
103	296720	Matipung R.F.	Lumbajong	2294	PS-2,MS-2	4
104	296724	Central Range Manja	Lumbajong	1509	PS-3,MS,	4
105	296730	Singhashan R.F.	Lumbajong	1327	PS-2,MS-3,	5
106	296789	BhitarKalioni(Merabheti)	**Nilip**	795	PS,MS,SS/HS	3
107	297927	Bongso Tiso (Longhop Tisso)	Nilip	515	PS,MS,SS/HS	3
108	297937	Kidu Bey	Nilip	185	PS,MS-2	3
109	297942	Longhup Teron	Nilip	766	PS,MS,SS/HS	3
110	297946	Langsomepi	Nilip	101	PS,PHSC	2
111	297981	Sarmen Tisso	Nilip	227	PS,MS-2	3
112	298008	Safapani	Nilip	451	PS,MS-2	3
113	298048	Bepari	Nilip	230	PS,MS-2	3
114	298067	Dakhara Hide Bey	Nilip	821	PS-2,MS,SS/HS-2	5
115	298164	Sonsiram Terang	Nilip	131	PS,MS-2	3
116	295449	Baithalangso	**Rongkhang**	1987	PS-5,MS-3,SS/HS, HSS,JC/C,CHC, PHSC, MCWC,SD, FWC,VET	17
117	295451	Tika	Rongkhang	1043	PS,MS-2,SS/HS, CHC,	5
118	295467	Hongkram	Rongkhang	1201	PS,MS-2,SS/HS, PHC,PHSC,VET	7
119	295468	Hongkram Adarsha	Rongkhang	1364	PS-3,MS-2,PHC, PHSC,	7
120	295470	Lutumari	Rongkhang	379	PS,MS,SS/HS	3

121	295471	Rupachithi	Rongkhang	513	PS,MS,SS/HS	3
122	295472	Serlongchor	Rongkhang	902	PS,MS,PHSC	3
123	295479	Langmepi	Rongkhang	2587	PS-2,MS-2,SS/HS	5
124	295491	Thepli Aram	Rongkhang	521	PS,MS,SS/HS	3
125	295492	Harlong Sora	Rongkhang	683	PS-2,MS,	3
126	295493	Jengkha	Rongkhang	2341	PS-2,MS-2,SS/HS, PHSC,VET	7
127	295503	Rikang Mehom	Rongkhang	715	PS,PHSC	2
128	295504	Phelangpi	Rongkhang	1033	PS-2,MS,	3
129	295506	Sarumatikhula	Rongkhang	1895	PS,MS-2,SS/HS	4
130	295508	Kheroni	Rongkhang	1384	PS-2,MS-3,SS/HS, PHC	7
131	295510	Arnam Anglong (Kheroni)	Rongkhang	1481	PS,MS-2	3
132	295512	Kheroni NepaliPgr.	Rongkhang	1504	PS,MS-2	3
133	295513	Kheroni Kachari Pgr.	Rongkhang	1782	PS-5,MS-2,SS/HS	8
134	295515	Bagisadubi	Rongkhang	2126	PS-2,MS-3,	5
135	295516	Doyangmukh	Rongkhang	2998	PS,MS-2,SS/HS	4
136	295517	Radhanagar	Rongkhang	1157	PS,MS-3,	4
137	295519	Deklem	Rongkhang	1531	PS-2,MS-3,SS/HS-2	7
138	295520	Lamsakham	Rongkhang	1017	PS,MS-2,	3
139	295521	Nawaibil	Rongkhang	7303	PS-5,MS-3,FWC	9
140	295523	Mailoo Bl No.4	Rongkhang	3700	PS-3,MS-3,	6
141	295525	Belbari	Rongkhang	3153	PS-4,MS-3,SS/HS	8
142	295527	Majiahadi	Rongkhang	1033	PS,MS-2,	3
143	295528	Jiribasa	Rongkhang	1358	PS-3,MS-3,	6
144	295529	Mosoka	Rongkhang	1133	PS,MS-2,	3
145	295530	Guha Gaon	Rongkhang	1041	PS,MS-2,	3
146	295532	Hajagapher	Rongkhang	1437	PS-2,MS-2,SS/HS-2	6
147	295533	Hawaipur	Rongkhang	1048	PS,MS-2,SS/HS-2	5
148	295534	Watijur No.2 Bl	Rongkhang	2574	PS-4,MS-4,	8
149	295536	Lambapathar	Rongkhang	2565	PS-4,MS-2,	6
150	295538	Deklem	Rongkhang	1953	PS-2,MS-3,SS/HS	6
151	295540	Maimaru Das Basti	Rongkhang	573	PS-2,MS,	3
152	295542	Dekreng Pgr.	Rongkhang	834	PS,MS-2,	3
153	295548	Chera Pathar	Rongkhang	1725	PS-4,MS-4,	8
154	295549	Cheng-ChengBil	Rongkhang	1248	PS,MS-2,	3
155	295553	Englong Parpan	Rongkhang	925	PS-2,MS,SS/HS,HSS	5
156	295556	Menmeji	Rongkhang	1629	PS-2,MS-2,	4
157	295557	Mukhim	Rongkhang	732	PS-2,MS-2,	4
158	295558	Lalmati	Rongkhang	622	PS,MS,SS/HS	3
159	295575	Karbi Rongsopi-1	Rongkhang	779	PS-2,MS,	3
160	295589	Kuthepi Nepali Gaon	Rongkhang	1119	PS,MS-2,	3
161	295597	Mugasong	Rongkhang	1600	PS-3,MS-2,SS/HS	6
162	295598	Tumpreng Bazar	Rongkhang	237	PS,MS, HSS,PHSC	4
163	295599	Tumpreng	Rongkhang	226	PS,MS, HSS,PHSC	4
164	295602	Upper Taradubi	Rongkhang	1536	PS,MS-2,SS/HS-2, HSS	6
165	295603	Namtaradubi	Rongkhang	1804	PS-4,MS-3,	7

166	295604	Bhelapara	Rongkhang	1315	PS-2,MS-2,	4
167	295605	Sat Gaon	Rongkhang	2535	PS-2,MS-2,	4
168	295606	Satgaon Bazar	Rongkhang	1361	PS-2,MS-4,	6
169	295609	Rongkuroi	Rongkhang	1691	PS-3,MS-2,	5
170	295610	Rongjamir	Rongkhang	371	PS-2,MS,	3
171	295616	Bogori Gaon	Rongkhang	1011	PS,MS-2,	3
172	295618	Hanlokrok	Rongkhang	955	PS-2,MS,SS/HS-2, PHSC	6
173	295622	Tengkeralangso	Rongkhang	1348	PS-2,MS,SS/HS	4
174	295641	Kolising Gaon	Rongkhang	1027	PS-2,MS-2,	4
175	295643	Angpong Gaon	Rongkhang	535	PS-2,MS,	3
176	295646	Bali Gaon	Rongkhang	517	PS,MS,SS/HS,HSS	4
177	295855	Rongkhana R.F.	Rongkhang	5848	PS-3,MS-3,FWC	7
178	295858	Bithung R.F.	Rongkhang	2701	PS-4,MS,	5
179	297234	Parkup Pahar No.1	**Rongmongwe**	84	PS,PHSC,	2
180	297235	Ti Langso Gaon	Rongmongwe	177	PHSC	1
181	297236	Parkup PaharNo.2	Rongmongwe	167	PS,PHSC,	2
182	297515	Dokai Bey(LongkiBey)	Rongmongwe	417	PS,SD,	2
183	297744	Engchin Langso	Rongmongwe	106	OTHERS	1
184	298099	Chondro Sing Rongpi	Rongmongwe	562	PS,MS,SS/HS,	3
185	297047	Panjuri Adai Hanse	**Samelangso**	274	PS-2,MS,	3
186	297058	Bhaluk Jan	Samelangso	683	PS,PHC	2
187	297063	Den Gaon Christian	Samelangso	425	PS,MS,SS/HS	3
188	297066	Den Gaon No.2	Samelangso	79	PS,PHC,VET	3
189	297068	Kangnek Tokbi	Samelangso	392	PS,MS,SS/HS,	3
190	297160	Jasiguri No.2	Samelangso	432	PS-2,MS,	3
191	297166	Dongka Chingthu-3	Samelangso	479	PS-2,MS,	3
192	297167	No.3 Jasiguri	Samelangso	368	PS-2,MS,	3
193	297187	Dongkarmukh Gaon	Samelangso	789	PS-2,MS,	3
194	297188	Hari Ronghang	Samelangso	352	PS-2,MS,	3
195	297194	Manikpur	Samelangso	407	PS,MS,SS/HS	3
196	297209	Etpo Taro	Samelangso	483	PS,MS,	2
197	297221	Bhim Teron and Langtuk Taro	Samelangso	325	PS-2,MS,	3
198	297395	Langhin Bazar Bl.1	Samelangso	947	PS-2,MS,SS/HS-2, HSS-2	7
199	297450	Dhupguri No.2	Samelangso	170	PS,PHC-2	3
200	297453	Tila Para No.1	Samelangso	131	OTHERS	1
201	297474	Sarso Bey Gaon	Samelangso	303	PS,OTHERS	2
202	297485	Samelangso Terang (Bazar area)	Samelangso	344	PS,MS,SS/HS	3
203	297485	Poisa Engti	Samelangso	326	PS,OTHERS	2
204	297753	Thekelangjun Bazar	Samelangso	163	PS,PHSC,MCWC	3
205	297773	Angjok Tokbi	Samelangso	116	OTHERS	1
206	295677	Umpaweng (Langhemphi)	**Socheng**	703	PS-2,MS,	3

207	295684	Rongpangbong	Socheng	1241	PS-2,MS-2,	4
208	295715	Jyrykyndeng	Socheng	1544	PS,MS-2,SS/HS,SD	5
209	297243	Ati Gaon	**Langsomep**i	893	PS,MS-2,	3
210	297305	Balijan Bazar Bosti	Langsomepi	1872	PS-2,MS-2,PHC	5
211	297353	Samoguri	Langsomepi	214	PS,PHSC	2
212	297396	Kur kut Bosti	Langsomepi	356	PS,MS,SS/HS	3
213	297430	Bey Engti Village	Langsomepi	237	PS,OTHERS	2
214	297437	No.2 Jaipur	Langsomepi	201	PS,PHC	2
215	801604	Hamren (TC)	Chinthong	8747	PS-14,MS-4,SS/HS-2,HSS-4,CHC,SD-2, FWC-2,	29
216	801605	Donkamokam **(TC)**	Rongkhang	9116	PS-11,MS-2,SS/HS, HSS-2,CHC,SD,FWC,	19
217	801606	**Diphu (TC)**	**Lumbajong**	**61797**	PS-35,MS-29, SS/HS-12,HSS-4, JC/C-4,CHC,SD, FWC,	**87**
218	801607	Bokajan (TC)	Bokajan	19877	PS-15,MS-19, SS/HS-4,HSS-4, CHC,SD-2,FWC,MCWC	47
219	296732	Laharijan Natun Bosti(CT	Bokajan	2508	NIL	0
220	801608	Howraghat(TC)	Howraghat	5443	PS-4,MS-4,SS/HS-2,HSS2,JC/DC,CHC ,SD-2,FWC	17
221	801609	Dokmoka (TC)	Samelangso	5478	PS-6,MS-2,SS/HS-2,HSS-2,CHC,SD	14
	TOTAL					**1041**

Source: Researcher's personal computation

APPENDIX - III

EDUCATIONAL INSTITUTIONS

Sl. Nos.	C.D Blocks	Name of Institutions	Nature of Facility	Year of Est.	Class: HS/HSS /Deg	Stream: Arts/Sc/ Com	Distance (in Km)	Nature of Building
1	Chinthong	Waisong College	Urban	1994	HS/Deg	Arts	2.5	Pucca
2	Chinthong	Hamren Govt. HSS	Urban	1974	HSS	Arts	3	Pucca
3	Chinthong	Don Bosco HS	Urban	1974	HSS	Arts	1.5	Pucca
4	Howraghat	Howraghat College	Urban	1994	Deg	Arts	0.5	Pucca
5	Howraghat	Howraghat HSS	Urban	1957	HSS	Arts &Sc	1	Pucca
6	Langsomepi	Thong Nokbe College	Urban	1984	HSS/Deg	Arts	2	Pucca
7	Langsomepi	Rukasen College	Urban	1992	Deg	Arts	1.5	Pucca
8	Langsomepi	Bakaliaghat HSS	Urban	1966	HSS	Arts	1	Pucca
9	Lumbajong	Diphu Govt. College	Urban	1964	HSS/Deg	Arts/Sc/ Com	2	Pucca
10	Lumbajong	Dhansiri HSS	Rural	2005	HSS	Arts	1	Pucca
11	Nilip	Harlongbi-Velongbi College	Rural	2008	HSS/Deg	Arts		Pucca
12	Nilip	Balipathar HSS	Urban	1959	HSS	Arts	2	Pucca
13	Rongkhang	Rangsina College	Urban	1983	Deg	Arts	1.5	Pucca
14	Rongkhang	Kopili College	Rural	1995	HSS	Arts	15	Pucca
15	Rongkhang	Bamonpo College	Rural	2018		Arts	17	kuchcha
16	Rongmongve	AngjokpaniHS	Rural	1974	HS	Arts	50	Pucca
17	Rongmongve	Rongmongve HS	Rural	1989	HS	Arts	35	Pucca
18	Samelangso	Dengaon HSS	Rural	2016	HSS	Arts	8	Pucca
19	Samelangso	Dokmoka HSS	Urban	1961	HSS	Arts	1	Pucca
20	Samelangso	Langhin HSS	Urban	2007	HSS	Arts	0	Pucca
21	Socheng	Jirikindeng Jr College	Rural	2016	Deg	Arts	0	Pucca
22	Socheng	2No.Jirikinden g LP School	Rural	1964	LP & Up Pr	--	0.5	Pucca

Source: Researcher‘s Field Survey

HEALTH (MEDICAL) CENTRES

Sl. Nos.	C.D Blocks	Name of Health centres	Nature of Facility	Type of Facility	Year of Est.	Nos. of villages covered (Approx)	Distance from HQ. (in Km.)	Nature of Building
1	Amri	Umpanai BPHC	Rural	PHC	-	50	8	Pucca
2	Amri	Putsari MPHC	Rural	MPHC	1998	08	270	Pucca
3	Amri	Rongjangphong SD	Rural	SD	2005	30	12	pucca
4	Amri	Umswai SC	Rural	SC	2010	09	283	pucca
5	Chinthong	Hamren CHC	Urban	SDHC	1983	16	0	pucca
6	Chinthong	Rongmandu SC	Rural	SC	1983	16	15	pucca
7	Howraghat	Lorengthepi MPHC	Rural	MPHC	1995	24	69	pucca
8	Howraghat	Langhin MPHC	Urban	MPHC	-	45	75	pucca
9	Howraghat	Samaguri SC	Rural	SC	2006	16	70	Pucca
10	Langsomepi	Bakalia CHC	Urban	CHC	1988	30	60	Pucca
11	Langsomepi	Howraghat CHC	Urban	CHC	-	30	0	Pucca
12	Langsomepi	Phuloni MPHC	Rural	MPHC	1976	30	70	Pucca
13	Lumbajong	Diphu CHC		CHC	-	-	0.5	Pucca
14	Lumbajong	Dhansiri MPHC	Rural	MPHC	1986	30	23	Pucca
15	Lumbajong	Taralangso SC	Rural	SC	-	20	6	Pucca
16	Nilip	Choukihola BPHC	Rural	BPHC	-	100	138	Pucca
17	Nilip	Deithor MPHC	Rural	MPHC	1956	50	8	Pucca
18	Nilip	Balipathar MPHC	Rural	MPHC	1979	42	65	Pucca
19	Nilip	Koilamati SC	Rural	SC	1990	12	130	Pucca
20	Rongkhang	Baithalangso BPHC	Urban	BPHC	1935	37	160	Pucca
21	Rongkhang	Donkamokam CHC	Urban	CHC	1994	187	144	pucca
22	Rongkhang	Hanlokrok MPHC	Rural	MPHC	2014	26	135	Pucca
23	Rongkhang	Kolonga SD	Rural	SD	1977	14	22	Pucca
24	Rongkhang	Tumpreng SHC	Rural	SHC	1986	40	134	Pucca
25	Rongkhang	Borthol SC	Rural	SC	1985	21	150	Pucca
26	Rongkhang	Kheroni SC	Rural	SC	1975	25	25	Pucca
27	Rongkhang	Hanlokrok SC	Rural	SC	1997	25	142	Pucca
28	Rongmongve	Rongmongve MPHC	Rural	MPHC	2001	40	247	Pucca
29	Rongmongve	Rongagora SC	Rural	SC	-	13	240	Pucca
30	Rongmongve	SillimKhowaSC	Rural	SC	1998	07	240	Pucca
31	Samelangso	Dengaon MPHC	Rural	MPHC	1957	55	95	Pucca
32	Samelangso	Dokmoka MPHC	Urban	MPHC	1971	39	88	Pucca
33	Socheng	Zirikendeng PHC	Rural	PHC	-	60	129	Pucca
34	Socheng	Umkhermi PHC	Rural	PHC	-	03	149	Pucca

Source: Researcher‘s Field Survey

VILLAGES SURVEYED

Sl. No.	C.D Blocks	Name of Villages Surveyed	Year of Est.	Popu-Lation (2019)	Name of communities	No. of House -holds	Type of Institution	Distance (in Km).
1	Amri	Shikdamakha	1953	461	Tiwa,Karbi	91	Pr to SS	35
2	Amri	Romphom	1921	556	Tiwa,,Khasi, Karbi,Nepali, Garo	114	No school	7
3	Amri	Pundurimakha	1950	491	Tiwa	75	Pr	33
4	Chinthong	Uzandongka	1938	688	Karbi,Tiwa	200	Pr	6
5	Chinthong	Harlongjove Ronghang Gaon	1995	1077	Karbi	66	Pr to Sec	2
6	Howraghat	Samaguri No.3	1942	500	Boro, Bihari, Bengali	100	Pr to Sec	9
7	Howraghat	Karkok Tongklong Bey	1920	578	Karbi	101	Pr	6
8	Langsomepi	No.2 Joypur	1964	266	Boro	45	Pr to middle school	8
9	Langsomepi	Mirdu Pathar	1950	800	Boro, Bengali	140	Pr	4
10	Lumbajong	Kherbari	1952	351	Dimasa,Nepali	72	Pr	26
11	Lumbajong	Demalu	2000	204	Dimasa,Nepali	41	Pr	27
12	Lumbajong	Ser Anglong Lunse Timung	2009	615	Karbi,Adibasi Assamese	131	No school	5
13	Lumbajong	Garo Basti	-	115	Garo,Adibasi, Boro,Karbi Nepali,Rengma Naga, Assamese	22	No school	3
14	Nilip	Kangbura Tisso	1966	485	Karbi	97	Pr to middle school	3
15	Nilip	Wophong Asar Teron	1930	310	Karbi	88	Pr to Sec.	16
16	Rongkhang	Rongpi Gaon	1967	283	Karbi, Nepali, Kochari,Bihari	27	H Sec	16
17	Rongkhang	Theso Bill	1974	175	Karbi, Garo, Kochari,Bihari, Nepali	19	Pr	17
18	Rongkhang	Chirimukam Timung Arong	1965	327	Karbi, Boro, Bengali,Nepali, Assamese	60	Pr	0.5
19	Rongmongve	WophongEngjai	1971	165	Karbi	26	Pr	16
20	Rongmongve	Kha Engti	-	349	Karbi, Adibasi	56	Nil	35
21	Samelangso	Etpo Taro	1953	101	Karbi	501	Pr	03
22	Samelangso	Hari Taro	1950	95	Karbi	685	Pr	1.2
23	Socheng	Rongchijeng	1991	500	Karbi, Nepali	150	Pr	5
24	Socheng	Zirikindeng Phangcho Arong	1950	7800	Khasi,Nepali, Karbi	500	Pr	0.5

Source: Researcher's Field Survey

APPENDIX- IV

LIST OF HEALTH CENTERS UNDER KARBI ANGLONG DISTRICT

Sl No.	Facility Name	Name of Health Centres	Block
1	Civil Hospital (CH)	Diphu Civil Hospital	Manja BPHC
1	Sub Divisional Hospital (SDCH)	Hamren SDCH	Boithalangso BPHC
1	Community Health Centre (CHC)	Bokajan CHC	Bokajan BPHC
2	do	Donkamokam CHC	Donkamokam BPHC
3	do	Bakalia CHC	Howraghat BPHC
4	do	Dentaghat CHC	do
5	do	Howraghat CHC	do
1	Block Primary Health Centre (BPHC)	Boithalangso BPHC	Boithalangso BPHC
2	do	Zirikindeng BPHC	Zirikindeng BPHC
3	do	Umpanai BPHC	Umpanai BPHC
4	do	Manja BPHC	Manja BPHC
5	do	Chowkihola BPHC	Chowkihola BPHC
1	Mini Primary Health Centre (MPHC)	Bhoksong MPHC	Boithalangso BPHC
2	do	Rongchek MPHC	do
3	do	Rongmandu MPHC	do
4	do	Rongpangbong MPHC	do
5	do	Balipathar MPHC	Bokajan BPHC
6	do	Deithor MPHC	Chowkihola BPHC
7	do	Dolamara MPHC	do
8	do	Malasipathar MPHC	do
9	do	Rongmongve MPHC	do
10	do	Hanlokrok MPHC	Donkamokam BPHC
11	do	Centre Bazar MPHC	Howraghat PBHC
12	do	Dengaon MPHC	do
13	do	Dokmoka MPHC	do
14	do	Langhin MPHC	do
15	do	Phuloni MPHC	do
16	do	Rajapathar MPHC	do
17	do	Samaguri MPHC	do
18	do	Ouguri MPHC	Umpanai BPHC
19	do	Putsari MPHC	do
20	do	Borlangfer MPHC	Manja BPHC
21	do	Taradubi MPHC	Donkamokam BPHC
22	do	Sildubi MPHC	do

23	do	Jaipong MPHC	Howraghat BPHC
24	do	Dhansiri MPHC	Manja BPHC
1	Subsidiary Health Centre (SHC)	Tumpreng SHC	Donkamokam BPHC
2	do	Balijuri SHC	Howraghat BPHC
3	do	Tekelangjun SHC	do
4	do	Mohendijua SHC	Manja BPHC
5	do	Mailoo SHC	Donkamokam BPHC
6	do	Kheroni SHC	do
7	do	Okreng SHC	Howraghat BPHC
1	State Dispensary (SD)	Borpothar SD	Bokajan BPHC
2	do	Dillai SD	do
3	do	Deithor SD	Chowkihola BPHC
4	do	Kolonga SD	Donkamokam BPHC
5	do	Borgaon SD	Umpanai BPHC
6	do	Rongjangphong SD	do
7	do	Khanduli SD	Boithalangso BPHC
1	Medical Sub Centre (MSC)	Rongmandu MSC	do
2	do	Hidipi MSC	Bokajan BPHC
3	do	Tinglijan MSC	do
4	do	Dikisir MSC	Boithalangso BPHC
5	do	Sildubi MSC	Donkamokam BPHC
6	do	Manikpur MSC	Howraghat BPHC
7	do	Kuther Banglow MSC	Boithalangso BPHC
8	do	Parkup Pahar MSC	Howraghat BPHC
1	Sub Centre (SC)	Badong SC	Boithalangso BPHC
2	do	Bhoksong SC	do
3	do	Borkok SC	do
4	do	Dalimbari SC	do
5	do	Durong SC	do
6	do	Hatigarh SC	do
7	do	Kungripi SC	do
8	do	Long-eh Luboi SC	do
9	do	Longpai SC	do
10	do	Phongjangre SC	do
11	do	Punja Borpothar SC	do
12	do	Rongchek SC	do
13	do	Tahpat SC	do
14	do	Tika SC	do
15	do	Amarajan SC	Bokajan BPHC

16	do	Borneria Mouzadar Gaon SC	do
17	do	Borneriya Ronghang Gaon SC	do
18	do	Borpothar SC	do
19	do	Deopani SC	do
20	do	Dilawjan SC	do
21	do	Ghorialdubi SC	do
22	do	Khotkhoti SC	do
23	do	Longkathar SC	do
24	do	Moh Khuti SC	do
25	do	Morakordoiguri SC	do
26	do	Safapani SC	do
27	do	Saibol SC	do
28	do	Saijang SC	Bokajan BPHC
29	do	Santipur SC	do
30	do	Sarihajan SC	do
31	do	Senso Bey SC	do
32	do	Upper Deopani SC	do
33	do	Deithor SC	Chowkihola BPHC
34	do	Deopani Balijuri SC	do
35	do	Dirring SC	do
36	do	Dolamara SC	do
37	do	Koilamati SC	do
38	do	Merabhiti SC	do
39	do	Mouzadar Gaon SC	do
40	do	Rongagora SC	do
41	do	Rongmongve SC	do
42	do	Silimkhowa SC	do
43	do	Tarapung SC	do
44	do	Upper Panjan SC	do
45	do	BIthung Rengthama SC	Donkamokam BPHC
46	do	Borthal SC	do
47	do	Dayungmukh SC	do
48	do	Derajuri KillingGaonSC	do
49	do	Deramokam SC	do
50	do	Hanlokrok SC	do
51	do	Hawaipur SC	do
52	do	Jengkha SC	do

53	do	Karbi Rongsopi SC	do
54	do	Lamsakhang SC	do
55	do	Langchithing SC	do
56	do	Linchika SC	do
57	do	Mailoo SC	do
58	do	Phangtengphrang SC	do
59	do	Satgaon SC	do
60	do	Serlongchor SC	do
61	do	Taradubi SC	do
62	do	Amoni SC	Howraghat BPHC
63	do	Basatiplong SC	do
64	do	Bhelughat SC	do
65	do	Borgonga SC	do
66	do	Centre Bazar SC	do
67	do	Chapong SC	do
68	do	Cherakani SC	do
69	do	Dighali Mazgaon SC	do
70	do	Donghap SC	do
71	do	Dumukhi Jalijuri SC	Howraghat BPHC
72	do	Eragaon Paharline SC	do
73	do	Ganesh Pathar SC	do
74	do	Ghorajan SC	do
75	do	Godabari SC	do
76	do	Habe Kro SC	do
77	do	Hanboka SC	do
78	do	Hatipura SC	do
79	do	Hidibonglong SC	do
80	do	Jaipong SC	do
81	do	Kalibhiti SC	do
82	do	Kanjuk Athoi SC	do
83	do	Kasojan Sc	do
84	do	Langsomepi Sc	do
85	do	Lutumari SC	do
86	do	Molesh Basti SC	do
87	do	Nopakghat SC	do
88	do	Pachim Sunpura SC	do
89	do	Palam Engti Sc	do
90	do	Parakhowa SC	do
91	do	Phongbrik SC	do

92	do	Phonglokpet SC	do
93	do	Podumpukhuri SC	do
94	do	Ponditghat SC	do
95	do	Rongtara SC	do
96	do	Samaguri SC	do
97	do	Samelangso SC	do
98	do	Selabor Natun Bazar SC	do
99	do	Sildharampur SC	do
100	do	Sokraghat SC	do
101	do	Tekelangjun SC	do
102	do	Uttar Borbill SC	do
103	do	Virwar SC	do
104	do	8 Km Lumding Road SC	Manja BPHC
105	do	Borlangfer SC	do
106	do	Chotalangfer SC	do
107	do	Dhansiri SC	do
108	do	Disobai Sc	do
109	do	Doldoli SC	do
110	do	Geeta Nagar SC	do
111	do	Kherbari SC	do
112	do	Khonbamon SC	do
113	do	Khorsing Terang SC	do
114	do	Langbrik SC	do
115	do	Langsoliet SC	do
116	do	Mijungdisa SC	do
117	do	Mohongdijua SC	do
118	do	Rongapahar SC	do
119	do	Rongkhelan SC	do
120	do	Taralangso SC	do
121	do	Thekerajan SC	do
122	do	Tichom Gaon SC	do
123	do	Upper Dilaji SC	do
124	do	Upper Hapjan SC	do
125	do	Bogazamin SC	Umpanai BPHC
126	do	Krokengdang SC	do
127	do	Morten SC	do
128	do	Ouguri SC	do
129	do	Romphom SC	do
130	do	Ulukunchi SC	do

131	do	Umchiken SC	do
132	do	Umlapher SC	do
133	do	Umpanai RFWC	do
134	do	Umsowai SC	do
135	do	Umwang SC	do
136	do	Panimur SC	Zirikindeng BPHC
137	do	Umkhermi SC	do
138	do	Catholic Hospital	Manja BPHC

Source: Office of the Joint Director of Health Services, Karbi Anglong, Govt. of Assam

QUESTIONNAIRES

QUESTIONNAIRE

HEALTH (MEDICAL) FACILITY

Date of Survey: / /20…...

Survey done by-

Part A: Basic Characteristics

1. Name of the Health Centre: _____
2. Name of the C.D Block: _____
3. Name of the Locality/Village/Area: _ _____
4. Nature of the facility: (Urban/Rural): _ _____
5. Post Office: ___ _____
6. Police Station: ____ _____
7. District: ____ _____
8. State: _____

Part B: Basic Characteristics

1. Type of Facility available: Type: ☐

   1. Hospital
   2. PHC
   3. MPHC
   4. Dispensary
   5. Community Health Centre
   6. Sub Centre
   7. Family planning centre
   8. Private Hospital
   9. Private Clinic or Polyclinic
   10. No health facility

2. In which Year did this medical facility open? Year: ☐☐☐☐

3. Number of Villages which comes under this facility. Number: ☐☐☐

4. Does this medical facility receive or other support from:
   a) the government Yes/No: ☐
   b) a religious organization Yes/ No: ☐
   c) a non religious charity or NRI Yes/No: ☐

5. How far is this medical facility from the District Hospital? Km: ☐☐☐

6. On an average how many out-patients does the facility treats each week? Number: ☐☐☐

7. What days of the week is the clinic open? For how many Hours is the clinic open?
   Mon? Hours: ☐☐
   Tue? Hours: ☐☐
   Wed? Hours: ☐☐
   Thu? Hours: ☐☐
   Fri? Hours: ☐☐
   Sat? Hours: ☐☐
   Sun? Hours: ☐☐

8. Does this medical facility have electricity? Yes/No: ☐
   If yes, is the source of electricity its own (electric generator)/ Government supplied? own/govt: ☐

9. Does this facility has telephone facility or operates other facilities? Yes/No: ☐

10. Does this facility have Ambulance? Yes/No: ☐
If yes, whether in working condition? If no, any alternative arrangement is made? _____

11. What is the main source of drinking water in this medical facility? ☐
Source:
1) Piped inside the facility
2) Piped outside the facility
3) Tube well/hand pump
4) Tanker truck/auto van
5) Bottled water
6) Others- river/canal/stream/pond/rainwater etc.

12. What toilet facilities are available for the use of patients? Toilet: ☐
0) No latrine
1) Traditional pit latrine
2) Ventilated improved pit latrine
3) Flush toilet
4) Others

13. If facility has a toilet: Is there a wash basin next to the toilet for washing hands? If No toilet, write 0 (zero) Yes: 1 No: 0 ☐

14. Is there fee for patients to register at this facility? Rs.: ☐☐☐

15. What is the usual visit fee charged for a routine visit? Rs.: ☐☐☐

Part C: Services Provided

16. What medical services are provided at this facility?

Sl. No	Services	No=O Yes = 1	Sl. No	Services/Treatment	No=O Yes = 1
1.	Child Immunization		9.	Diarrhea	
2.	Contraception: Oral pills		10.	Change of wound dressing	
3.	Contraception: Injection		11.	Stitching wound dressing	
4.	Piercing Boils		12.	Malaria	
5.	Saline I.V		13.	Rabies	
6.	Treatment of gynecological condition		14.	Minor Illness like Fever	
7.	Treatment of Tuberculosis		15.	Child Birthdelivery	
8.	Eye exam		16.	Blood transfusion	

17. Does the clinic do the tests for …

Sl No.	Types of Tests	No/Yes	Nature of Tests (strike off which ever not applicable)
1.	Blood Test: Hemoglobin		Collects & send out/analyses here
2.	Blood Test: leukemia		Collects & send out/analyses here
3.	Blood Test: Aids		Collects & send out/analyses here
4.	TLC Total lymphocyte count		Collects & send out/analyses here
5.	Urinalysis: Routine		Collects & send out/analyses here
6.	Urinalysis: Culture		Collects & send out/analyses here
7.	Stool Test		Collects & send out/analyses here
8.	Pregnancy Test		Collects & send out/analyses here
9.	Malarial parasite		Collects & send out/analyses here
10.	Cerebral Malarial parasite		Collects & send out/analyses here
11.	TB		Collects & send out/analyses here

18. What medical equipment is available in this medical facility?

Sl. No	Equipments	No=0 Yes=1	Sl. No	Equipments	No=0 Yes=1
1.			6.		
2.			7.		
3.			8.		
4.			9.		
5.			10.		

19. Does the Health centre provide all the Medicines free of costs? Yes/No
If no, what are the alternative facilities/ arrangements does the patients get?

_____

Part D: Employees

20. How many people currently work at this clinic/center? Number: | | |

21. No. of Doctors. Number: | | |
No. of Nurses Number: | | |
No. of Lab Technicians Number: | | |
No. of Pharmacist Number: | | |

22. Are there any sanctioned post currently lying vacant? Number: | | |
If yes, how many?

Part E: Medical Facility Observation

23.	Is the examination room a separate room that provides privacy from other patients? If no, are there curtains for closing the area to provide privacy?	Separate Exam Room: 1 Same room with curtain: 2 Same room, no curtain: 3	☐
24.	If yes to curtains: Are the curtains clean, or do you see blood stains or other droppings?	No curtains=0 Clean=1 Dirty= 2	☐
25.	Is the floor clean, or do you see a lot of dust, or food remnants, or garbage on the floor?	Clean=1 Dirty=2	☐
26.	Are the walls cleans or do you see spider webs or scribbling, or moisture, or peeled of paints?	Clean=1 Dirty= 2	☐
27.	Is there a sink or basin in or near the room for washing hands?	No=0 Yes=1	☐
28.	Is there an examination Table in this room?	Yes=1 No=0	☐
29.	The type of needles use to give injections and immunization.	Disposable needle =1 No disposable needle =2 Both kind of needle =3 No needles=4	☐

Observation of Outside of Medical Facility:

30.	Type of approach road to the Hospital.	Footpath=1: Kutcha=2: Pucca=3:	☐

31. Comments about the Respondent:_____
_____
_____
_____

32. Any other comments: _____
_____
_____

33. Surveyor's observations: _____
_____
_____
_____

QUESTIONNAIRE

VILLAGE SURVEY

Date of Survey: / / 20…….

Survey done by-

A. Village Identification

1. Name of the Head of Family:

2. Name of the Village:

3. Year of establishment:
4. Total Number of Households in the village:
5. Post Office: _____
6. CD Block: _____
7. District: _____
8. State: _____
9. Name of Village Head: _____
10. Phone Number of Village Head: _____

B. Village Structure:

1. As per the 2011 Census (Village):
   a) Total Population — Persons:
2. Total Population:
   Male:
   Female:
3. Total number of House Holds: — House Holds:
4. Total Area of the Village Approx. (in Km^2) — In Km^2:
5. Present Total Population: — Persons:
6. Total Population: — Male:
   Female:

C. Village Composition:

1. Name the communities (jatis) with the largest number of Population.
   a) _____ d)_____
   b) _____ e)_____
   c) _____
2. Name the Religions they are belong to _____

3. Do any people from outside come to this village to work? Yes/ No: ☐

Less than 20? ☐
More than 20?

If yes, from
a) Same district _____ c) Other State _____
b) Same State_____ d) Outside India _____

4. Where do people mostly come from? Urban: ☐
Rural: ☐

D. Employment:

a) Besides agriculture, what kind of employment facilities are available in this village?
(Largest source of employment) _ _____
_____

b) What kinds of employment are available outside the village but within commuting distance of the village?
(Largest sources of employment) _____
_____

c) What types of work people do who leave the village? _____
_____

d) Where do people mostly find their work? Urban: ☐
Rural: ☐

E. Infrastructure:

1. Name of the nearest town?

2. How far is the nearest town from the village? In Km.: ☐☐

3. Name of the District Head Quarter: _____

4. Is any part of this village accessible by road?
No, foot path only= 0: ☐
Yes, cutcha road= 1:
Yes, pucca road= 2:

5. If the village has a cutcha road/foot path, how far is the village from a pucca road? In Km.: ☐☐

6. Is this road useable during monsoon? Yes/No: ☐☐

7. Does this village have electricity? Yes/No: ☐☐

8. If yes, how much percent of the households in the Village has electricity? Percent: ☐☐☐

9. For how many years have the households in this village had electricity? Years: ☐☐

10. Does this village have access to mobile phone service? Yes/No.: | | |

11. About what percentage of the households in the village have any kind of phone? Percent: | | | |

12. What are the three most common sources of drinking water in this village?
    i) ii) iii)

13. What are the three most commonly used cooking fuels for households in this village?
    i) (ii) iii)

14. Is there bus stop in this village? Yes/No.: | | |
    If no, How far is the closest bus stop? Km.: | | |

15. How far is the closest Railway station? Km.: | | |

16. Are there any of the following in this village? Yes/No: | | |
    If no, how far is the nearest -

i)	Police station	km:	
ii)	Market/Bazar	km:	
iii)	Post office	km:	
iv)	Fair price shop	km:	
v)	Bank branch office	km:	
vi)	Community centre	km:	
vii)	Self help groups	km:	
viii)	Development group/NGO	km:	

17. Are there any public programmes that promote in this village?
    Employment schemes, such as….

i)	Sampoorna Grameen Rozgar Yojona	Yes/No :	
ii)	Other women's welfare	Yes/No :	
iii)	Skill development	Yes/No :	
iv)	Non formal Edu program (adult education)	Yes/No:	
v)	National Old Age Pension scheme (NOAPS)	Yes/No:	
vi)	Widow's Pension Schemes (WPS)	Yes/No :	
vii)	National Maternity schemes(NMBS)	Yes/No :	
viii)	National Disability Pension	Yes/No :	
ix)	Safe drinking water	Yes/No :	
x)	Sanitation	Yes/No :	
xi)	Housing	Yes/No :	
xii)	Forestry	Yes/No :	

18. Are there any Anganwadi Programs for…

i)	Immunization	Yes/No :	
ii)	Health Checkup	Yes/No :	
iii)	Any other Public Program	Yes/No :	

19. Have there been any Immunization campaigns or camps, or any pulse polio campaigns in the last year? Yes/No : ☐

F. Public and Private Schools and Colleges (Educational Institutions):

Sl. No.	Does this village have…	Government		Private		If None in village: Km. to nearest
		Numbers	Est. year	Numbers	Est. year	
1.	Anganwadi or other child care centre					
2.	Primary school (I-V)					
3.	Middle school (VI-VIII)					
4.	Secondary school (IX-X)					
5.	Higher secondary school (XI-XII)					
6.	College					
7.	Vocational or technical institute					
8.	Madrassa					
9.	Girls' school					

N.B: List the schools that most children of this village attend:

1. Which is the main Govt. primary school that children from this village attend?
   Name: _____
   Location: _____
   _____
   Telephone Number (if any) _____
2. Which is the main private Primary school that children from the village attend?
   Name : _____
   Location: _____
   _____
   Telephone Number (if any) _____

G. Medical Facilities:

Sl. No	Does this village have…	If Yes			If None, in village: Kilometer to nearest
		No. of facilities	Est. Year	How often it remain open?(Daily/1-5 days per week/ Irregularly/never).	
1.	Civil Hospital				
2	Community Health Center				
3	Primary Health Center				
4	MPHC				
5	PHSC				
6	State Dispensary				
7	Health Sub Center				
8	Govt. Maternity Center				
9	Private Hospital				
10	Private Maternity Center				
11	Private Clinic				
12	Any other Govt. medical facility				
13	Private Pharmacy				

1. Name the medical clinic/centre often used by the Village?
   Name: _____
   Location: _____
   _____
   Telephone Number (if any) _____
2. Where is the main PHC (primary Health Center) that people usually use?
   Name: _____
   Location _____
   _____
   Telephone Number (if any) _____
3. Where is the main Private medical clinic or Dispensary that people use most often?
   Name : _____
   Location : _____
   _____
   Telephone Number (if any): _____

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PHOTO PLATE

PHOTOS

EDUCATIONAL INSTITUTIONS

Plate 1: DIPHU GOVERNMENT COLLEGE, DIPHU

Plate 2: AXOM SARBA SHIKSHA ABHIJAN MISSION, KARBI ANGLONG

Plate 3: OFFICE OF THE DISTRICT PRIMARY EDUCATION, KARBI ANGLONG

Plate 4: RUKASEN COLLEGE, BAKALIA

Plate 5: RANGSINA COLLEGE, DONGKAMOKAM

Plate 6: RANGSINA JUNIOR COLLEGE, DONGKAMOKAM

Plate 7: JIRIKINDENG JUNIOR COLLEGE

Plate 8: JIRIKINDENG L.P.SCHOOL

Plate 9: NO.2 JIRIKINDENG L.P.SCHOOL

Plate 10 : DONKAMOKAM PARK, DONKAMOKAM

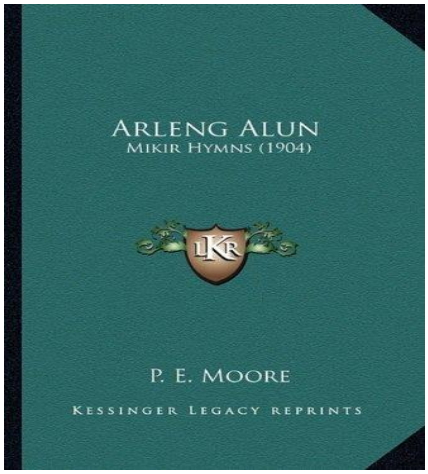
Plate 11 :HOWRAGHAT HIGHER SECONDARY SCHOOL

Plate 12 :BAKALIAGHAT HIGHER SECONDARY SCHOOL

Palate 13: DENGAON HIGHER SECONDARY SCHOOL

Plate 14: TIKA BAPTIST CHURCH (BAITHALANGSO)

Plate 15: THE FIRST CATECHISM OF MIKIR



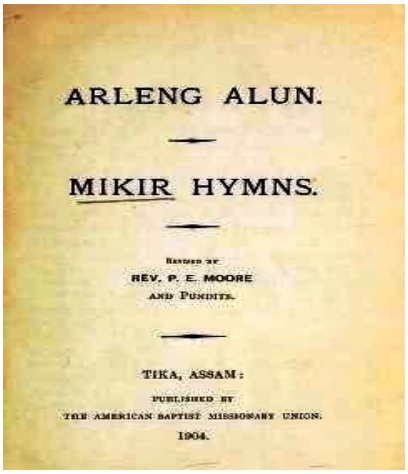


Plate 16 : THE FIRST MIKIR HYMNS

PRIMARY DATA COLLECTION

Plate17:Interaction with the Village Head man during Field Survey (Hori Taro Village)

Plate 18:Interaction with the Village Head man during Field Survey (No.2 Joypur village)

Plate 19: Interaction with Doctor during Field Survey (Mohongdijua)

Plate 20: Visit to Central Library, NEHU, Shillong

Plate 21: Visit to North Eastern Council, Secretariat, Shillong

Plate 22: Visit to Office of the Deputy Director of Economic and Statistics, Karbi Anglong, Diphu

MEDICAL (HEALTH) CENTRES

Plate 23: JOINT DIRECTOR OF HEALTH SERVICES, DIPHU

Plate 24 : NATIONAL HEALTH MISSION (NHM), DIPHU

Plate 25: ENTRANCE GATE, DIPHU CIVIL HOSPITAL (CH)

Plate 26 :MANJA BPHC

Plate 27: MOHONGDIJUA SHC

Plate 28: MEDICAL TOOLS AND EQUIPMENTS, MOHONGDIJUA SHC

Plate 29 :WITH MEDICAL OFFICE STAFF OF MOHONGDIJUA SHC

Plate 30: WITH MEDICAL OFFICE STAFF OF MANJA BPHC

Plate: 31 :BAKALIA 30 BEDDED RURAL HOSPITAL

Plate 32: HOWRAGHAT BPHC & CHC

Plate 33: BAKALIA CHC, BAKALIA

Plate 34: SAMAGURI STATE DISPENSARY(SD)

Plate 35: CENTRE BAZAR MPHC

Plate 36: PHULONI PHC, PHULONI

Plate 37: LANGHIN 10 BEDDED PHC, LANGHIN

Plate 38: DENGAON MPHC, DENGAON

Plate 39: BALIPATHAR PHC & MPHC

Plate 40:DEITHOR MPHC, DEITHOR

Plate 41: RONGMONGVE MPHC

Plate 42: RONGMONGVE SC

Plate 43: KAILAMATI SC

Plate 44: SILIMKHUWA F/W SC

Plate 45: PUTSARI MPHC

Plate 46: ZIRIKINDENG PHC

Plate 47: UMPANAI BLOCK PHC, UMPANAI

Plate 48: DONGKAMOKAM COMMUNITY HEALTH CENTRE (CHC)

Plate 49: BAITHALANGSO BPHC

Plate 50: RONGJANGPHONG MPHC

Plate 51: HANLOKROK SC

Plate 52: ROAD TO DONGKAMOKAM

Plate 53: BORTHAL SUB CENTRE (SC)

Plate 54: ROAD TO UMLAPHER

Plate 55: UMLAPHER TOWN

Plate 56: TARALANGSO SC, TARALANGSO

Plate 57: DISOBAI SC, DISOBAI

Plate 58: UMLAPHER SC, UMLAPHER

Plate 59: GODABARI SC, KHEJURBARI

Plate 60: ULUKUNCHI ROAD, ULUKUNCHI

Plate 61: ULUKUNCHI ROAD

Plate 62: ULUKUNCHI ROAD