

**RURAL RESOURCE MARKETING AND THE ROLE OF
TRANSPORT NETWORK IN MOKOKCHUNG DISTRICT,
NAGALAND**

**Thesis Submitted to Nagaland University
In Partial Fulfillment of the Requirements
For the Degree of**

**DOCTOR OF PHILOSOPHY
in
GEOGRAPHY**



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2015**

Dedicated to my beloved son
Lt. Yimlanger



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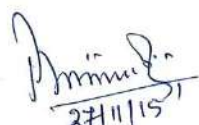
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CERTIFICATE

This is to certify that the thesis submitted by Shri. R. Bendangtemjen towards the degree of Doctor of Philosophy (Ph.D) in the Department of Geography on the title **“Rural Resource Marketing and the Role of Transport Network in Mokokchung District, Nagaland”** embodies the result of his own work. To the best of my knowledge the data and facts recorded in the study are based on his own research work.

I therefore, recommend that this thesis may be placed before the examiners for evaluation for the award of the Ph.D of this University.


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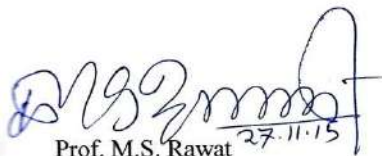
Declaration

I, Mr. R. Bendangtemjen, do hereby declare that this thesis on **“Rural Resource Marketing and the Role of Transport Network in Mokokchung District, Nagaland”**, submitted for the award of the Degree of Doctor of Philosophy in Geography comprises the results of my own research work carried out in the Department of Geography, Nagaland University. The contents of this thesis did not form basis of the award of any previous degree to me or to the best of my knowledge to anybody else and that the thesis has not been submitted by me for my research degree in any other University.

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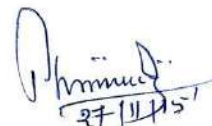
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(R. Bendangtemjen)

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Chapter-1

Introduction

1.1 Introduction

The development and advancement of a region depends on the tactful utilization of resources and its proper management. Resource does not refer to a thing or a substance but to a function which a thing or a substance may perform or to an operation in which it may take part, namely the function or operation of attaining a given end such as satisfying a want (Zimmermann, 1933). The term rural resources comprise mainly of forest products, agricultural produce and all others obtained from the rural areas utilised to satisfy the needs of the people.

Mokokchung district located on the North Western part of Nagaland is endowed with varied geo-physical and agro-climatic conditions, making it a rich repository of biotic resources. It is considered to be among one of the biodiversity hot spot regions of the world. India is a mega diverse country and is home to nearly 8 per cent of the world's total species of plants and animals. It houses four of the 34 global biodiversity hotspots:- the Himalayas, the Indo-Burma region, the Western Ghats – Sri Lanka and the Sundaland.

The favourable climatic condition with luxuriant forest cover provided the people enough resources in the past. The land could produce enough to meet the food requirements and the produce from the fields were sufficient. The needs of the people were limited so they were satisfied with the availability of the bare minimum requirement and therefore marketing of the produce was uncommon among the people. However, trade with the Ahom as early as the 13th century can be traced back that was carried out on barter system. The people of the district exchanged their

agricultural produce like ginger, chilly, pumpkin, pulses, cotton, betel leaves etc., in the plains with salt, agricultural implements, dried fish, cattle, buffaloes, iron etc. An important trade route was the Naga Ali which was constructed during the reign of Ahom king Suklenmong and it runs from Bar Ali to Naga hills (Ghosh, 1979). There was no road connectivity and due to the absence of vehicles for transportation of those exchanged goods, the people had to travel on foot carrying all the goods and essential commodities on their back. Even today some of the people in the villages recount their journey to the plains for doing such trade which normally took one to two days depending on the distance of their villages, for them to go down and come back after doing the business. In recent years due to opening of road network and availability of all the requirements in the market, such activities have become a thing of the past. Today money is used as the medium of exchange.

The district comprises of 71.37 per cent (Census, 2011) of rural population. Due to the practice of age old method of shifting cultivation by majority of the farmers which is subsistence in nature and the restriction imposed by the difficult terrain for large scale farming, the marketing of agricultural produce has not developed in the district. According to Thakur (1997), shifting cultivation is a primitive agricultural practice practised at the primitive level of operations under unconducive surroundings for a sustainable agriculture. In this process the cultivator first clears a chunk of good forest standing mostly on a hill slope. Almost all the tree species except fruit bearing species are cut at a stump height of 2' to 3' and then the branches as well as their lops and tops are burnt after they are dried up. Then agricultural seeds are sown on this patch of land after a light soil preparation. During

the initial two or three years good crops are harvested at a diminishing rate and then the land is abandoned until the hardy forest species recolonises the abandoned land into a renewed vegetation of inferior quality.

The XII Report of the National Commission on Agriculture states that agricultural marketing is a process which starts with a decision to produce a saleable farm commodity. It involves all the aspects of market structure or system, both functional and institutional, based on technical and economic considerations and including pre and post harvest operation, assembling, grading, storage, transportation and distribution. The fundamental basis of marketing are the three ds i.e., difference, desire and distance (Granier and Delobez, 1979). The function of marketing starts with differences or inequality in areas, such as geo-economic and technological factors, while the desire to sell the produced material and also a desire to purchase the same is necessary; the distance is a governing factor between the two. If the people are to be encouraged to increase agricultural production, it is necessary that ample marketing facilities are provided to them so that agricultural surplus can be unloaded in the markets. Since majority of the people depends on agriculture, improvement in their standard of living depends upon increased agricultural production. This brings into prominence the importance of ample communication facilities (Chand and Puri, 1999). The availability of transport facilities plays a vital role in transfer of goods and services especially agricultural produce, which are fast perishable items and therefore needs to be disposed at the earliest. It helps the farmer to move their perishable agricultural products soon to markets and mandis (Tiwari,

2015). Another important feature of transport network is that it controls the price of the commodities in the market.

Roads play an important role for communication, transportation of goods and services especially in the hilly terrain where other means of transportation is not possible and when it comes to agricultural marketing it becomes very essential that road should be in excellent condition. The district of Mokokchung, though hilly in topography is blessed with a pleasant climatic condition with some scattered fertile river valleys. In the past decades these hilly tracts have been cultivated with a variety of agricultural crops. It could sustain the people throughout the year without depending much on the outside products. The pressure on land due to urbanisation has given rise to various ecological problems like destruction of the forest cover that has resulted in the deterioration of soil quality. It ultimately affects the productivity of the crops. The rivers on the lower plains can sustain the areas throughout the year with some efforts on water management and the monsoon rain that feed the hilly tracts is just enough for the kharif crops of the jhum fields. The existing agri link road of all the villages, made possible by various agencies like that of NREGA, MGNREGA, Department of Agriculture, Horticulture etc., should be maintained and the marketing system also needs to be evaluated for better coordination so that the farmers will get maximum benefits, which will ultimately encourage them for higher production.

The study of rural resource marketing and the role of transport have been prompted by the fact that not much work have been done on this aspect from the district and since majority of the people depends on agricultural activity, it is

important to take up a detailed study so that in the long run this can form as a basis for more development. Though there are a variety of rural resources, the study has focused more on the produce from the forest and agriculture, the distribution of road networks and marketing of those produce at selected locations along the roadside. It has also considered the importance of judicious utilisation and management of the available resources.

1.2 Objectives

The main objectives of the study are:-

1. To study and assess the resources marketed by the local citizens.
2. To propose the promotion of sustainability in the use of resources in rural areas.
3. To study the impact of transport network in development of market centre.
4. To analyse the impediments faced by the rural people in marketing their produce.
5. To study and encourage the local farmers to dominate the markets.

1.3 Hypothesis

1. Less utilisation of resources results in backwardness of a region.
2. Better transport networks boost economic development.
3. Demand of a product in the market determines the quality of the product.
4. In the absence of proper storage system, market and transport network, surplus agricultural production is a waste.

1.4 Data Base and Methodology

The study is being conducted mostly through empirical method and field work, using both Primary and Secondary sources.

1. Primary data-

- (a) Based on collection of information from the field through interviews and use of questionnaires on the spot.
- (b) Field survey of resources utilisation and its marketing system was conducted at three locations.
- (c) Spatial analysis of the study area has been done based on descriptive and analytical methods.

2. Secondary data- Secondary source of information were collected from authentic government publications, official documents, census, reports and books.

3. Statistical methods like those of sampling technique and cartographic representation of data were used to analyse the collected informations.

1.5 Study Area

Mokokchung is one among the 11 districts of Nagaland. It has a total geographical area of 1615 sq. km. The district lies between 26 °12 ' N to 26 °45 ' N Latitudes and 94 °18 ' E to 94 °50 ' E Longitudes. It is bounded by the State of Assam on the North, Tuensang and Longleng district on the East, Zunheboto on the South, and Wokha district and Assam on the West. Mokokchung Town is the administrative

headquarter situated at a height of about 1325.08 meters above mean sea level. According to 2011 census, it has a total population of 194622 persons out of which rural population constitute 138897 persons accounting to 71.37 per cent of rural character. The density of population is 121 persons / sq.km with a sex ratio of 925 females per 1000 males. The district comprises of 6 distinct ranges i.e., Ongpangkong, Langpangkong, Asetkong, Changkikong, Japukong and Tsurangkong which runs in a parallel pattern. The Ongpangkong range located at the South Eastern part of the district has the highest elevation and extends continuously to the North towards Langpangkong range which lies on the extreme Eastern region. The Asetkong range branches out from this range towards the Western part and joins the Changkikong range that lies on the West running parallel to the Ongpangkong range. Further West there is another parallel hill range having lower elevation comprising of Japukong and Tsurangkong which finally merges with the plains of Assam valley. The district is divided into 9 administrative circles along with the district Headquarter in which there are 108 recognised villages (2011 Census). Fig. 1.1 represents the locational map of the study area i.e., Mokokchung district. The administrative headquarter Mokokchung Town headed by Deputy Commissioner is situated on the extreme Southern part of the district. There are two divisional headquarter headed by Additional Deputy Commissioner (ADC) at Mangkolemba and Tuli. The other administrative circles are at Ongpangkong, Chuchuyimlang, Kubolong, Changtongya, Alongkima, Longchem and Merangmen. The relief is represented mostly by hilly terrain, though small patches of rich fertile valleys are found scattered along the rivers. Road is the only means of transport system that connects almost all the villages of the district. National Highway (NH)-2 passes

through the district connecting with Kohima the State Capital and Amguri (Assam). Another road, State Highway (SH)- 6 (now changed to National Highway-702D) connects the district headquarter with Mariani (Assam) which also acts as a lifeline for the neighbouring districts of Tuensang, Zunheboto and Longleng.

Three locations (marked as study area in Fig. 1.1) have been identified for the purpose of doing research. These areas are situated along the highway where marketing of the resources takes place on a daily basis. The study on the utilisation of available resources and its management will not only help the people of the district but it can boost for the development of the State. The three areas that have been earmarked are Changki Junction along State Highway (SH)- 6 (now changed to National Highway-702D). It is located at Changkikong range and acts as an important Junction as many of the villages from this range commute through this place. The second area selected for the study was Salangtem market in the heart of the Town. It is located at Ongpangkong range and as it is in the district headquarter many of the neighbouring villages comes for marketing to this centre. And the third area selected for the study was Changtongya Town along the National Highway (NH)- 2 located in Langpangkong range. This market also acts as an important market centre for many of the villages that are located in this range. The study will try to give an insight on the various aspects and problems faced by the farmers for marketing and suggest measures for its development.

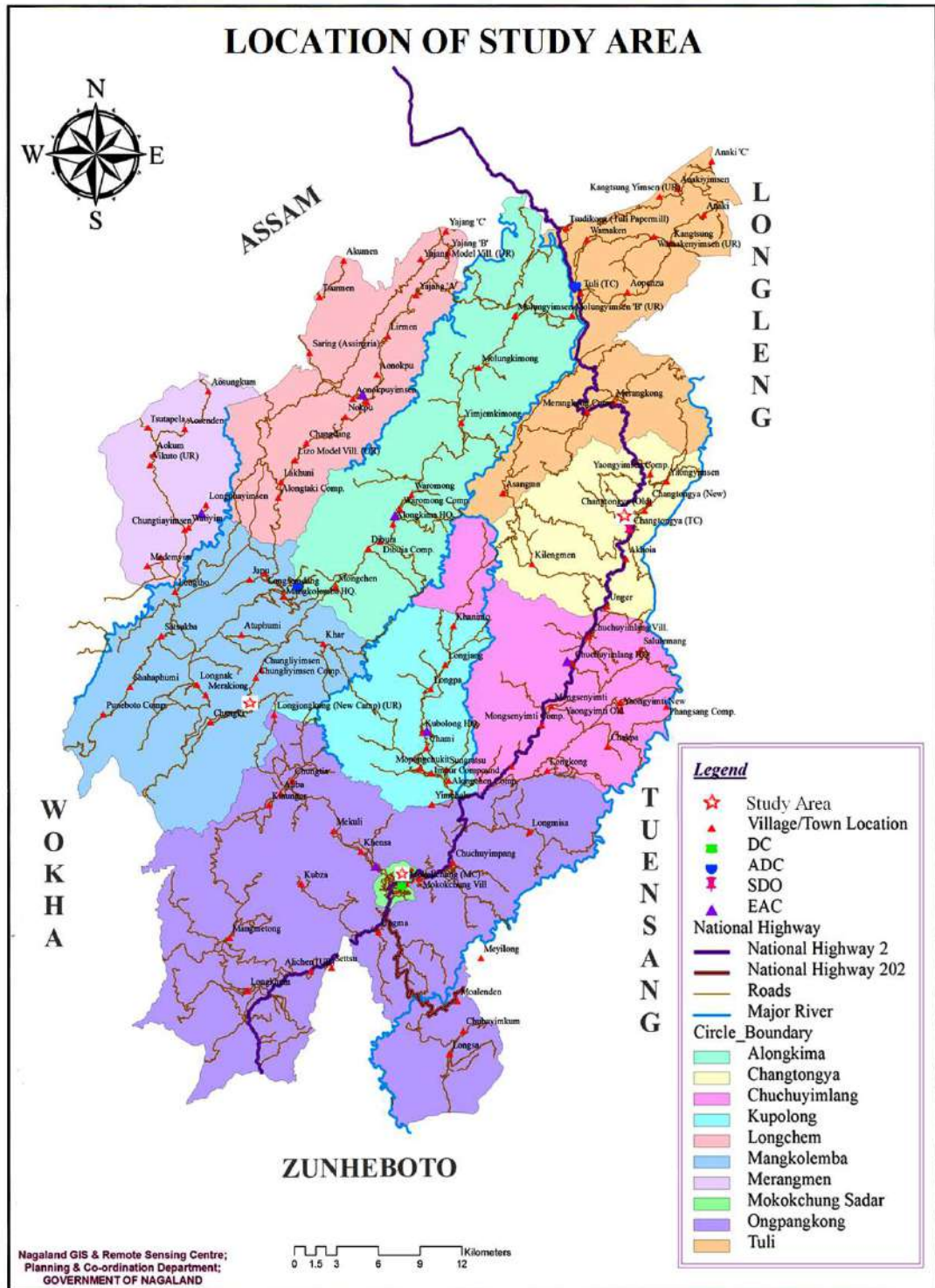


Fig. 1.1: Location of Study Area

1.6 Statement of the Problem

The district of Mokokchung is endowed with vast natural resources and if harnessed with proper planning, it can boost in the growth of its economy. According to 2011 census the district comprises of 71.37 per cent of rural population that depends mostly on agriculture. The favourable climatic condition coupled with suitable soil would help in the production of large quantity of agricultural produce, but due to lack of good market facilities, the farmers get discouraged as they cannot sell their hard earned labour that goes to waste. The people still depend on the age old practice of shifting cultivation on the hilly tracts which is destroying the rich diversity of flora and fauna, while the fertile valleys found in small tracts along the river remains uncultivated due to poor road connectivity. On the other hand, the market is dominated by products that are brought from outside the State. The present condition of the market is so dependent on the outside products that even a day blockade leads to empty market scene which is threatening the survival of the people. This needs to be addressed with proper planning and management strategies.

1.7 Significance of the study

The significance of the study is that it tried to focus on the availability and distribution of resources from the rural areas. A detailed collection of data on the rural resources available in the district have been attempted and analyse the pattern of utilization and marketing of the produce both natural and cultivated items. The impact of transport networking on the mobilization of resource has been accounted

and the findings of the study tried to highlight the farmers and policy makers, the ground reality of the existing resource condition, the present trend of the dependent market scenario and also the importance of developing a good transport and market networking system, setting up of modern storage facilities and proper channelization of markets to encourage local farmers and entrepreneurs. The study has also tried to suggest measures to utilize the resources at the maximum while taking into consideration the sustainability of the environment and its conservation.

1.8 Review of Literature

To define resource, Zimmerman (1993) may be quoted for his famous definition by saying that Resource “does not refer to a thing or a substance but to a function which a thing or a substance may perform or to an operation in which it may take part, namely the function or operation of attaining a given end such as satisfying ‘a want’”.

Khanna and Gupta (1999) defined resources as “means of attaining given ends”. These ends may be satisfaction of individual wants or the attainment of social objectives. Thus anything useful or anything having the attribute of utility may be termed as resource only because they are useful and satisfy some human wants. But resource includes many more things. They includes not only material things like land, forest, coal, machinery etc., but also intangible things like good health, knowledge, social harmony etc., because all these things have the attribute of utility.

It has already been repeatedly asserted that the functionality of a thing or a substance with relation to human wants makes it a resource, but skepticism arises as

to what makes a thing functional to human needs. The answer immediately springs from a particular faculty of man himself i.e., faculty of knowledge (Sadhukhan, 1982).

Belshaw (1969) while defining market states that “markets are sites with social, economic, cultural and other references marks, where there are a number of buyers and sellers, where the price offered and paid by each is affected by the decisions of the others”.

Discussing about marketing, Saxena (1988) states that, the orthodox theory starts from individual self sufficiency to barter, followed by periodic assembly of buyers and sellers and finally establishment of permanent shops and markets as well as the start of daily and long distance trading.

Barker (1983) has defined marketing as the performance of all business activities involved in the flow of goods and services from the point of initial agriculture production until they are in the hands of the ultimate consumer.

According to Husain (2002), the accessibility to the market is a major consideration in the decision making of the farmer. The intensity of agriculture and the production of crops decline as the location of cultivation get away from the marketing centres. This is particularly noticeable when a bulky but low value crop has to be transported to the market. If it takes much time to send the produce, especially at the peak time, to the market when the farmer could have been profitably employed in other activities. The marketing system also influences the decision making of the farmer. In most of the countries the agricultural commodity markets

are controlled by the buyers rather than sellers. The farmers however, can influence the market by storing their products on the farms or in cold storages until prices are remunerative.

In the words of Saxena (1990), market centre as an organism is not a passive mechanical phenomena contributing to a geometric pattern spread out upon the earth's surface but rather active. Their activity may be seen in the form of commerce or marketing. Marketing is a process or phenomenon of interaction among producers, distributors, buyers and users or in other words, it includes all processes and services a commodity goes through as it travels from producer to the consumer. The main function of marketing is to ensure that goods are not only transported from the areas of production to the areas of consumption, but that they must be transferred into the hands of the consumers.

The fundamental basis of marketing are the three 'ds' i.e., differences, desire and distance (Granier and Delobez, 1979). The function of marketing starts with difference or inequality in areas, such differences being mainly due to geo-economic and technological factors. While desire to sell the produced material and also a desire to purchase the same is necessary, the distance is a governing factor between the two.

"The maximum intensity of commercial exchange will take place if the difference is pronounced, the desire is strong and distance short" (Granier and Delobez, 1979).

Periodicity is an essential element of local indigenous market structure of most undeveloped countries as it was of medieval Europe (Hodder 1965).

The marketing manager, who in agriculture is usually the farmer himself, is responsible for the totality of a company's market offering, covering such factors as the range of products to be offered, prices charged, discounts to be offered, communications media to be employed, and the channels through which the product or service is to be made available.

Periodic markets play a key role in the internal trading process, mediating exchanges between farmers, craft manufacturers, fore strollers and intinerant traders on the other hand (Smith, 1971).

Describing the rural markets in China, Skinner (1974) pointed out two important facts. The first for a mobile firm, the total amount of demand encompassed by the marketing area of any single rural market is insufficient to provide a profit level which enables the entrepreneur to survive....when a group of related markets operates on coordinated periodic schedules, he can arrange to be in each town in the circuit of its market.

Thunen (1826) in his book 'The Isolated State' considered the problem of various form of agricultural production in relation to markets.

Prasad (1985) have discussed that unlike in the case of manufacturing products, the entire production of different agricultural commodities does not go to the market. The produce actually marketed depends upon the marketable surplus, immediate need for cash, price trends, availability of storage facilities etc.

Marketing is crux of the whole food and agriculture problems. It would be useless to increase the output of food and be equally futile to set up optimum

standards of nutrition, unless means could be found to move food from the producer to the consumer at a price which is remunerative to the producer and is within the consumer's ability to pay.

The success of any agricultural development programme rests ultimately on the efficiency of the marketing system. The welfare of the agricultural producer is influenced by the conditions prevalent in the marketing sector.

The call to "produce more" without providing an efficient marketing machinery which could assure a fair return to the producer- seller carried no conviction with the farmer.

In unregulated markets, the innocent farmers are invariably exploited by middlemen by their malpractices such as an important requisite of a good system of agricultural marketing is the supply of accurate information regarding the present and possible future trend of prices in different markets to the producers.

The first and foremost deficiency lies in lack of organization among the Indian farmers. They being the small cultivators scattered all over the country having very little time and knowledge to look to the marketing side of their produce, cannot organise themselves so as to bargain on equal terms on large scale and with a powerful organization behind them.

As the mandis and unregulated markets are not subjected to any statutory control, the farmers have to pay various market charges, long established by custom. The charges include taxes and tolls, commission, brokerage, handling charges, charges for other services.

The essential important function of transport was admirably summarized by the economist Milne and Laight (1965) which states “The transport industries which undertake nothing more than the mere movement of persons from one place to another have constituted one of the most important activities of man in every stages of advanced civilization”.

Transportation facilities also have a direct bearing on the cropping patterns of a region. Better transport linkages are advantageous because of the economies in farm labour and storage costs which they make possible. These savings in turn help to make it economic for farmers to buy fertilizers and better equipments. Better transport also makes it possible for farmers to put their less accessible land to more, productive use. In areas inadequately served by modern means of transportation, the surplus produce is often damage either by adverse weather or by rats, pests and diseases. In the hilly states of North East India (Meghalaya, Mizoram, Nagaland, Manipur, Arunachal Pradesh) costly crops like ginger, pineapple and banana are grown in surplus quantities but poor means of transportation and inadequate road linkages deprive the cultivators of most of the profits.

Symanski and Bromley (1974) have established the relationship between market development and the ecological complex. The four variables of ecology i.e., population, environment, technology and organization provide an invaluable basis for market development.

In a detailed survey of weekly markets in Rajasthan, Saxena (2004) reveals that the determining factor of the morphology of weekly market is the main street or

streets along which the market is held. In the region under study, about 90 per cent markets are held along roads.

The Asnawar market is an example of crossroad pattern with bus-stand as the controlling point.

In all the three markets, bus-stand is the controlling point and shops have been arranged along road as well as along side roads.

Krishi Vigyan Kendras (KVK), Nagaland (2009) in their study on Vision 2020, has opined that despite the growing awareness, farmers are reluctant to cultivate cash crop due to lack of marketing linkages, absence of marketing organization, storage facilities and poor transportation which create negative impact for sale of their products. Some cash crops such as leafy vegetable and cucurbits are sold on the road sides.

According to ATMA (2014), these days vegetables and fruits produced in the district are also sold in the markets although many essential products still continue to be brought in through the neighbouring State of Assam.

Singh and Kanaujia (2015) defined vegetables as important components of Indian agriculture due to their nutritional value, medicinal value, industrial value and export potential. They are known for their short duration and high productivity per unit area, providing a valuable source of income leading to improved livelihood.

Shifting cultivation known as Jhumming is one of the most ancient system of farming believed to have originated in the Neolithic period during 7000 B.C (Borthakur, 1992).

Jhum cultivation is woven into the traditions and culture of the Nagas with major land use under Jhum. Traditionally all the tribes in the State practice slash and burn type of cultivation. This type of cultivation has brought lots of tremendous impact on environment in the recent years (Pereira and Fernandes, 2005).

Shifting cultivation according to Thakur (1997), is a primitive agricultural practice practised at the primitive level of operations under uncondusive surroundings for a sustainable agriculture.

Jhum cultivation involves slashing down of trees and bushes over the forest areas, drying and burning, sowing of seeds of host of crops including paddy by using stick, dibbler or by hand before the onset of monsoon. Crops are raised for a few seasons, then the area is abandoned once in 2 or 3 years because of loss of soil fertility and erosion. The farmers called Jhumias, then shift over to other lands and resort to similar practice with cutting and burning down the forest. Leaching, erosion and loss of fertility takes place rapidly and the field per unit of land becomes progressively lower. Land and water system which is the basic life supporting factor and a prime mover of socio-economic development has already fallen into the clutch of the law of diminishing returns with the reduction of productivity vis-a-vis inputs and gross physical degradation of the system (Moursi, 1984; Christanty, 1986).

Husain (2002) has discussed that the history of shifting cultivation is as old as the history of agriculture itself. Shifting cultivation has been described as an economy of which the main characteristics are rotation of fields, use of human labour only, short period of occupancy alternating with long fallow periods.

Chapter-2

Geographical Background of

Mokokchung District

2.1 Introduction

Mokokchung district of Nagaland is represented by hill ranges with numerous rivers and streams. The altitude is between 150 to 1650 metres above mean sea level and is a part of the Naga Hills which is a dismembered branch of the Eastern Himalayas. From the East of the Himalayas some ranges have risen and goes through Naga Hills, Manipur and Mizoram to the Bay of Bengal. The district being located in these hills the ranges are spread from North East to South West, though some ranges have gone to other directions also. The district is mostly hilly and there are few patches of plain areas. The ranges are higher on the East than the West which ultimately joins the plain of Assam valley. There are several ranges and they are more or less parallel and have gone from North East to South East. These more or less parallel ranges have a distinct topographic character where there are steep slope on one side of the hill, while the other side have gentle slope which provided the perfect location for setting up of village especially for defensive purpose. The district is characterised by lowland and mid slopes with varying degree of slopes and having sub- montane climate, foothills with undulating to rolling topography and having warm sub tropical climate, mountains and hilly terrain covered with vegetations. It enjoys three seasons viz. summer (March- May), monsoon (June- September) and winter (October- February). Due to prolonged rain and high humid conditions the natural vegetation is characterised by sub- tropical evergreen rainforests and coniferous vegetation (KVK, 2009).



Fig. 2.1: Locational Map of Mokokchung District

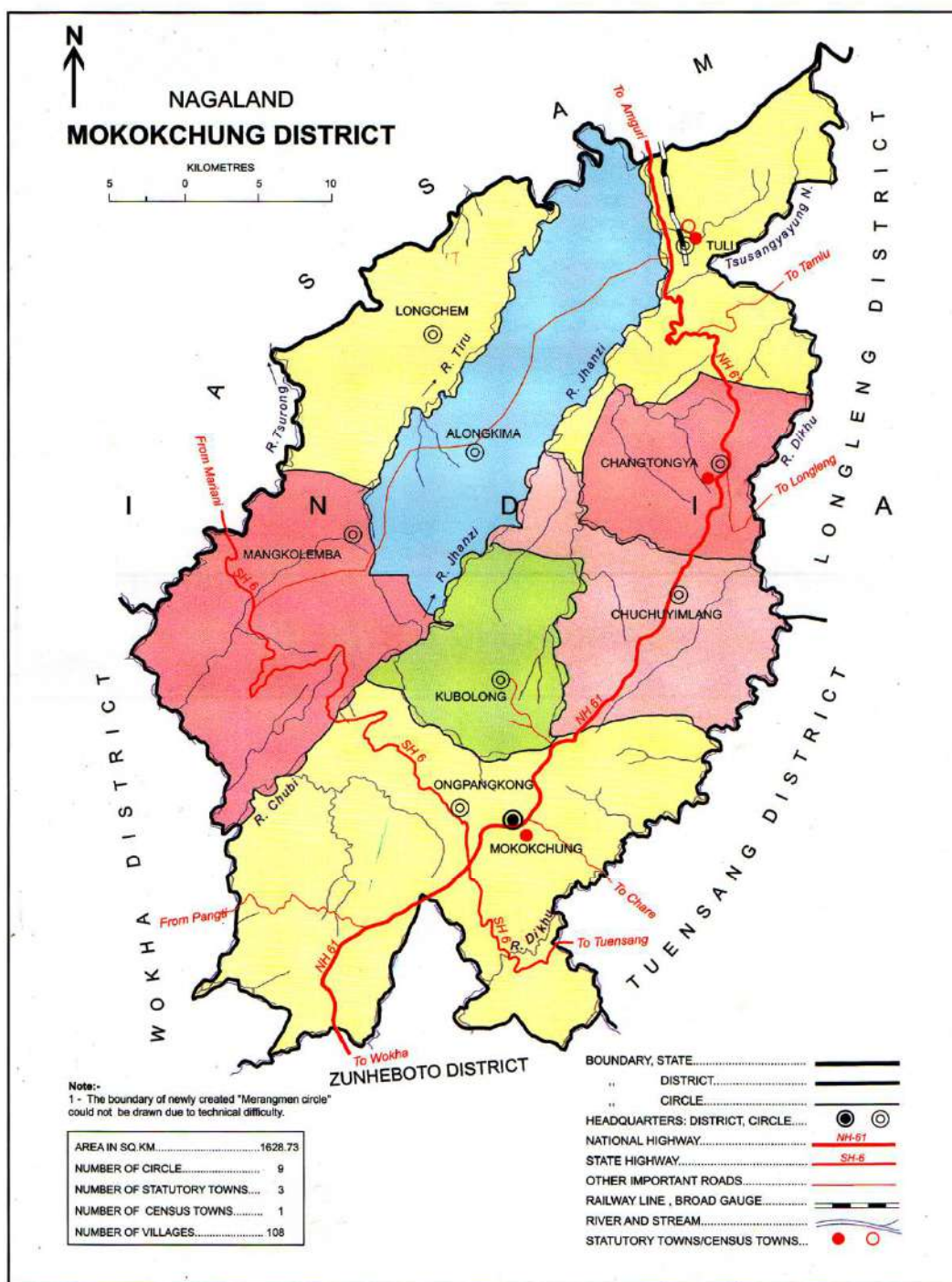


Fig. 2.2: Administrative map of Mokokchung District

* NH 61 renamed NH-2

* SH-6 changed to NH-702D

2.2 Physiography

Physiographically Mokokchung district comprises of six distinct ranges- viz- Ongpangkong, Langpangkong, Asetkong, Changkikong, Japukong and Tsurangkong. Ongpangkong range is located on South Eastern most part of the district forming an irregular boundary of the Ao area with the Lotha and Sumi on the South and Sangtam on the East and comprises of 19 villages. Langpangkong is the Easternmost range stretching on a North East direction along the course of the Dikhu river. This range covers a major portion of the district comprising the highest number of village with a total of 29 villages. Asetkong is a central range running from East to West but compared to other ranges it is the shortest one with only 10 villages. Changkikong is a parallel range East of Japukong range which comprise of 18 villages with one Sumi village. Japukong is the outermost range stretching from the North East to the South West bordering Assam. There are 19 villages spread over in this range. And Tsurangkong is located on the extreme South West of the district bordering with Assam which has 13 villages including 3 Sumi villages mostly on the areas bordering Assam.

A characteristic feature of the topography of these six ranges is that although most of the ranges are represented by steep slope it is observed that some part of the hills, slope down with gentle gradient. The physical settings of the district have a great impact on the settlement pattern of the people. The migration and occupational structure of the people have also followed the topography. The settlement and cultivation of the land clearly indicate the dominance and influence exerted by the physical relief. As such during the time of enmity when head hunting and frequent

raiding of one village by another was prevalent, they needed defence for which they established their villages on the hill top. The relief is also oriented in such a way that the height of the ranges gets reduced from the East towards the West which ultimately merges with the plains of Assam valley. Fig. 2.3 represents the Relief map of Mokokchung district. It can be clearly observed from the given map that the parallel ranges spreading from the North-East to South West exhibit higher elevation on the Eastern part of the district. The topography follows a particular pattern that in all the six ranges the slope is very steep on one portion while the slope on the other side are comparatively gentle (with some exception) which generally merged into a river or stream. The people have made use of such advantageous relief for their protection and cultivation. The relief exhibits a pattern where the hill ranges are the highest on the South Eastern part of the district. The topography of the district plays an important role which can be clearly observed in the method of cultivation i.e., shifting cultivation on the hilly tracts and terrace cultivation on the valley areas. Specialisation of crop depends on the altitude of the place (the crops though it grows in almost all part of the district some areas can produce more). Road network which is the only means of transportation also follow the alignment and distribution of the different hill ranges.

RELIEF MAP OF MOKOKCHUNG

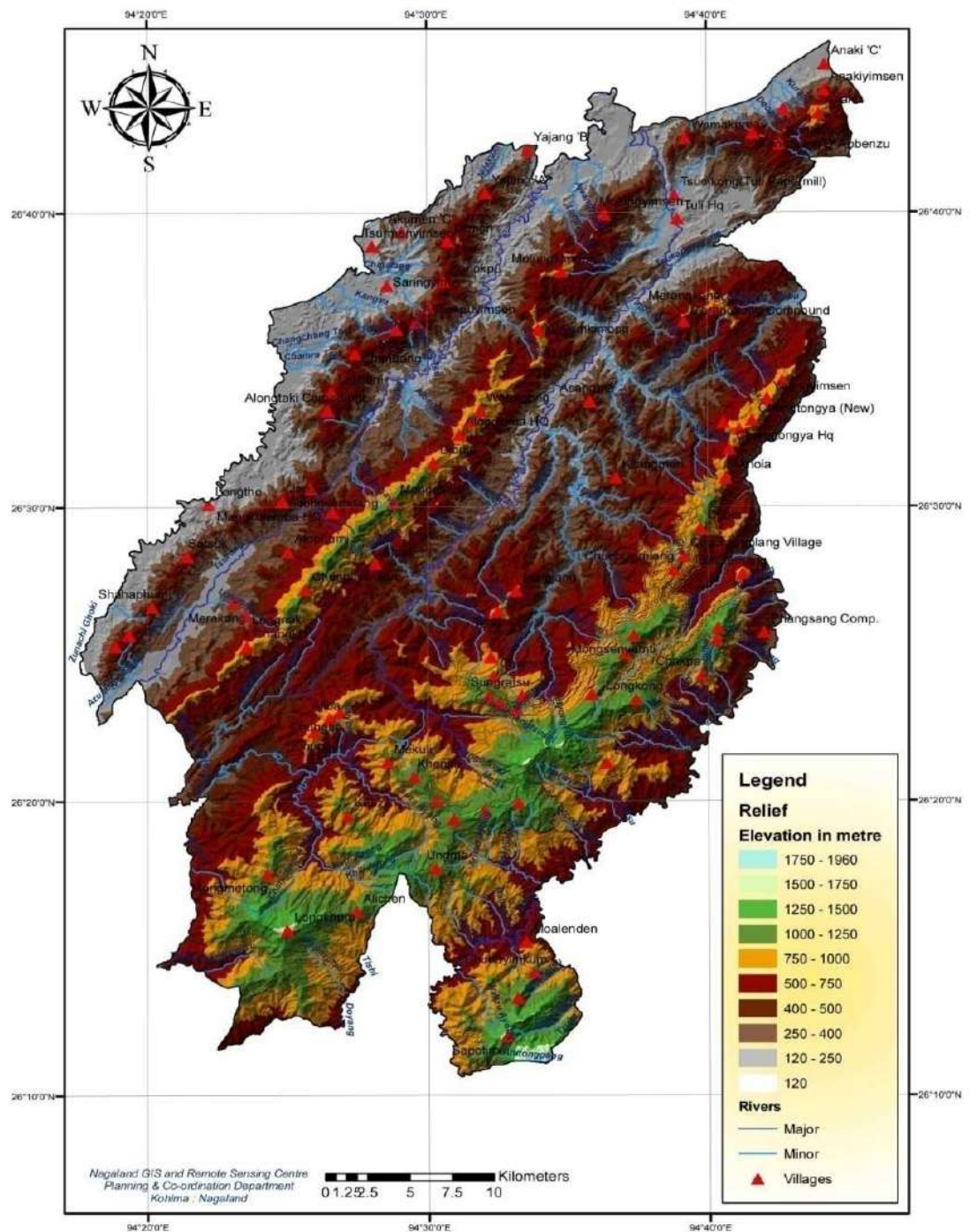


Fig. 2.3: Relief map of Mokokchung District

2.3 Drainage

The presence of numerous hill ranges in and around Mokokchung district have given rise to many rivers and streams. The orientation of the relief is strikingly exposed by the flow of the rivers and streams. Almost all the rivers flow from the South towards the North though at certain point the course of the river bends following the relief of the area. Fig. 2.4 represents the Drainage map of Mokokchung district in which it can be observed that Milak, Dikhu, Tsurang or Desai, Tsumok, Menung are some notable rivers that flow between the glens and gorges of the different ranges. The characteristic features of some important rivers in the district are discussed.

Milak River- The source of Milak river is found in the heart of Mokokchung Town. It flows down from the source westward and makes an abrupt bend near Chungtia and flow toward North until the river leaves the hills and turns Westward for the plains of Assam valley above Amguri and flows through Sibsagar district. It is the longest river that flows through Mokokchung district and is known as Jhanzi in Assam. Tsurong is an important tributary of Milak river.

Dikhu River- Dikhu river flows from the Northern flank of the Nurato mountains in Sema area. It is known as Longa or Nanga by the Semas and Tsula by the Aos. The river flows Westward from the source and enters Mokokchung district West of Longsa village, then goes further Northward forming a boundary between Aos on one side and the Sangtam, Phom and Konyak on the other side. Then it flows

further Northward through the hills of Mon district and flows down to the plains near Naginimora. Its main tributary is Nanung.

Tsurang or Desai River- This river has its source West of Chungliyimsen village which flows Southward through the hills of Ao area in the Northern part of Wokha district. It suddenly bends Westward and then towards the North forming a crescendic bend and flows further until it enters the plains West of Changdang village.

Tsumok river- The source of this river is found in Changtongya area which flows through Asangma and Merangkong villages and then joins Milak river.

Menung river- Menung is also a tributary of Milak river. The main source of this river is from the Minkong forest which flows in between Sungratsu and Longjang village on one side and Mongsenyimti and Chuchuyimlang village on the other.

The important valleys of the district worth mentioning are Changki, Tuli, Tsurang etc., which are on the Western side of the district adjoining the plains of Assam and some notable ones small in area but that are used for cultivation are found in the villages of Longsa, Kinunger, Mangmetong and Chungtia.

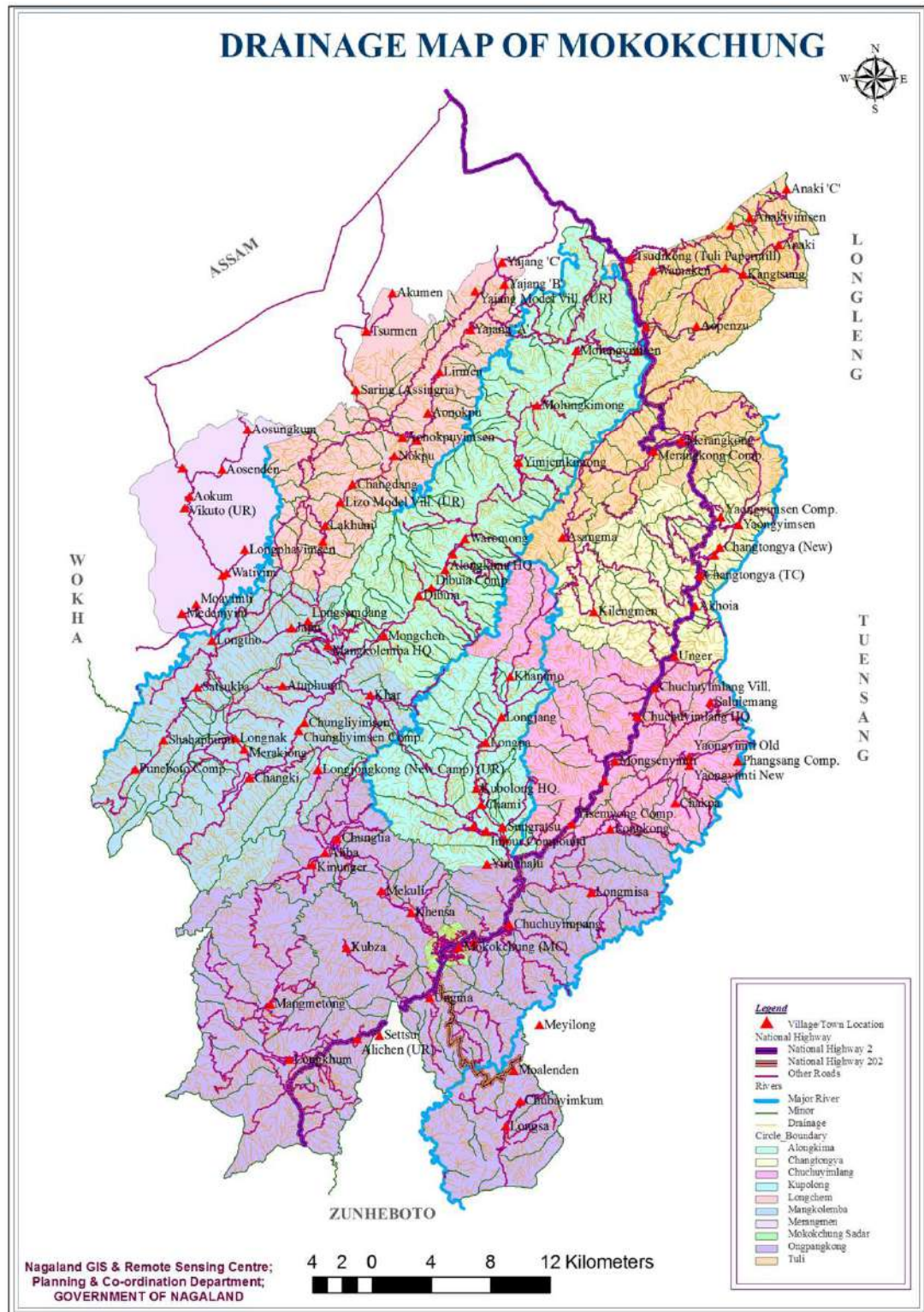


Fig. 2.4: Drainage map of Mokokchung District

2.4 Climate

The district of Mokokchung located on the extreme North Eastern corner of the Indian Sub continent enjoys monsoon climate. It experience monsoon with a difference from that of the adjoining plains of Assam wherein the winter is cold and summer is mild. The district experiences moderate to cool winters and warm summers with an average rainfall of about 250 mm. Climate of Mokokchung is moderate and pleasant except in some scattered patches of the valley areas of Changki, Tsurang and Tuli during summer where the temperature remains comparatively higher. The details of rainfall, temperature and relative humidity of Mokokchung district for a period of five years i.e., 2010- 2014 were collected from the meteorological data of State Agriculture Research Station (SARS), Yisemyong, Mokokchung.

2.4.1 Rainfall

The highest amount of rainfall in the district during the five year period was experienced in the year 2010 with an annual rainfall of 3071.5 mm. The subsequent years show a decreasing trend. Rainfall records in the month of December during the period 2010- 2014 shows that except in 2010 the other years did not receive rain, while in the month of January also there was rainfall in 2011 and 2012.

Table 2.1 Average Rainfall data (in mm) during 2010 - 2014

Month	Average Rainfall (in mm)				
	2010	2011	2012	2013	2014
Jan	Nil	221.6	133.6	Nil	Nil
Feb	Nil	48.3	160	200	43
Mar	453.5	103.5	168	206.6	185.8
Apr	276.9	355	285.6	242.3	246
May	239.7	340.8	215.9	435.5	193.1
June	472.3	426	307.6	388.7	298.6
July	364.6	358.9	517.7	308.1	376.4
Aug	396.6	238.8	378.1	337.5	386.8
Sep	399.7	288.3	329.3	234.5	314.5
Oct	390.7	117	251.5	382.6	212.5
Nov	Nil	446	50	Nil	225
Dec	77.5	Nil	Nil	Nil	Nil
Total annual rainfall (in mm)	3071.5	2944.2	2797.3	2735.8	2481.7

Source: State Agricultural Research Station, Yisemyong, 2014

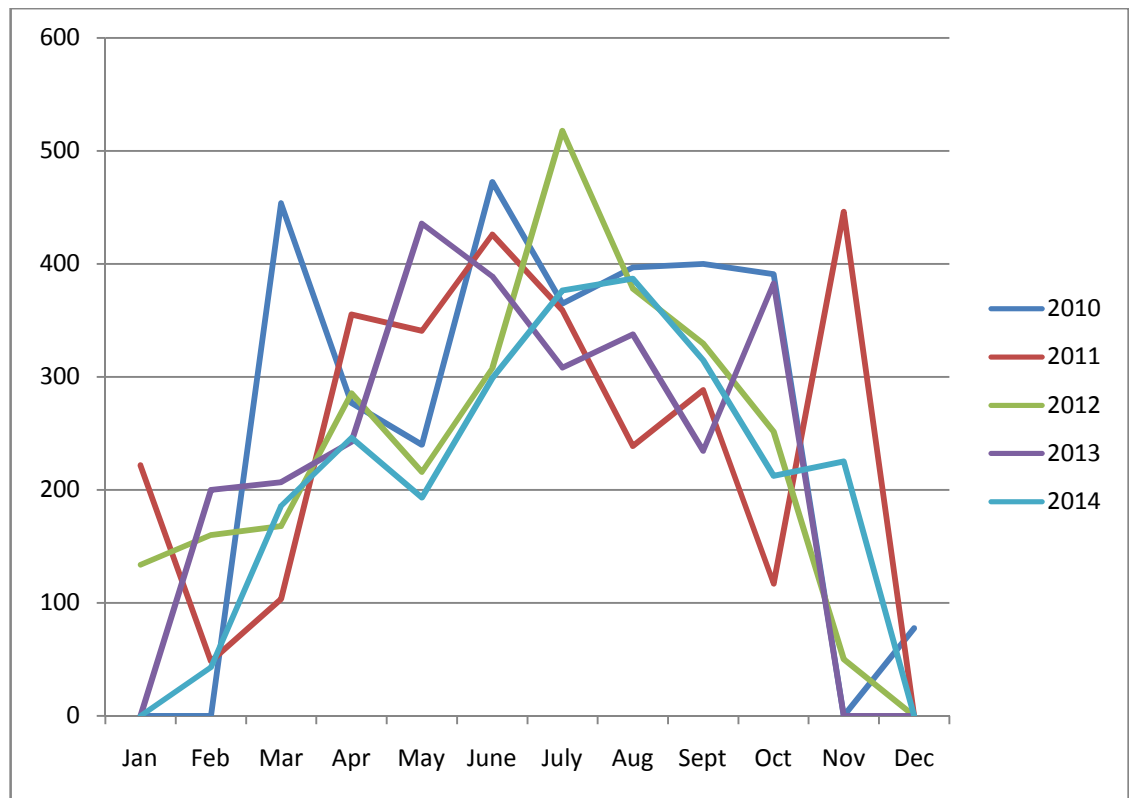


Fig. 2.5: Average Rainfall data (in mm)

2.4.2 Temperature

Temperature of the District also recorded the highest in the year 2010 with an average maximum of 28.5°C in the month of August and the lowest temperature was recorded in 2013 with an average minimum of 8.9°C in the month of January.

**Table 2.2: Average minimum – maximum temperature of Mokokchung District
during 2010 – 2014**

Month	2010 Average Min- Max (°C)	2011 Average Min- Max (°C)	2012 Average Min- Max (°C)	2013 Average Min- Max (°C)	2014 Average Min- Max (°C)
Jan	9.6-20.2	11.7-15.0	10.2-14.0	8.9 -13.4	11.6-15.8
Feb	11.8-23.5	15.0-18.3	13.9-17.8	12.9-17.5	14.8-18.3
Mar	15-25.6	17.8-21.7	17.3-21.5	15.4-20.5	18.3-20.7
Apr	17.1-25.9	19.6-23.6	18.6-22.8	16.6-22.0	20.7-25.7
May	18.3-27.2	20.5-24.6	21.7-25.7	18.4-23.5	21.5-26.9
June	17.5-24.8	22.1-26.0	22.0-26.1	22.5-25.2	22.0-26.6
July	20.2-28.1	22.2-25.7	22.4-26.3	24.0-26.7	22.5-26.9
Aug	20.3- 28.5	22.4-26.0	22.4-26.2	20.0-27.9	21.9-26.5
Sep	19.4-27.6	21.9-25.8	21.8-26.1	22.0-24.3	21.2-25.8
Oct	17.3-26.3	20.2-24.2	19.5-23.9	20.5-22.1	20.0-25.4
Nov	13.3-23.7	15.5-19.4	16.1-20.2	18.8-20.6	16.3-21.3
Dec	9.6-21.1	13.2-17.0	12.7-17.1	13.3-17.0	13.5-19.7

Source: State Agricultural Research Station, Yisemyong, 2014

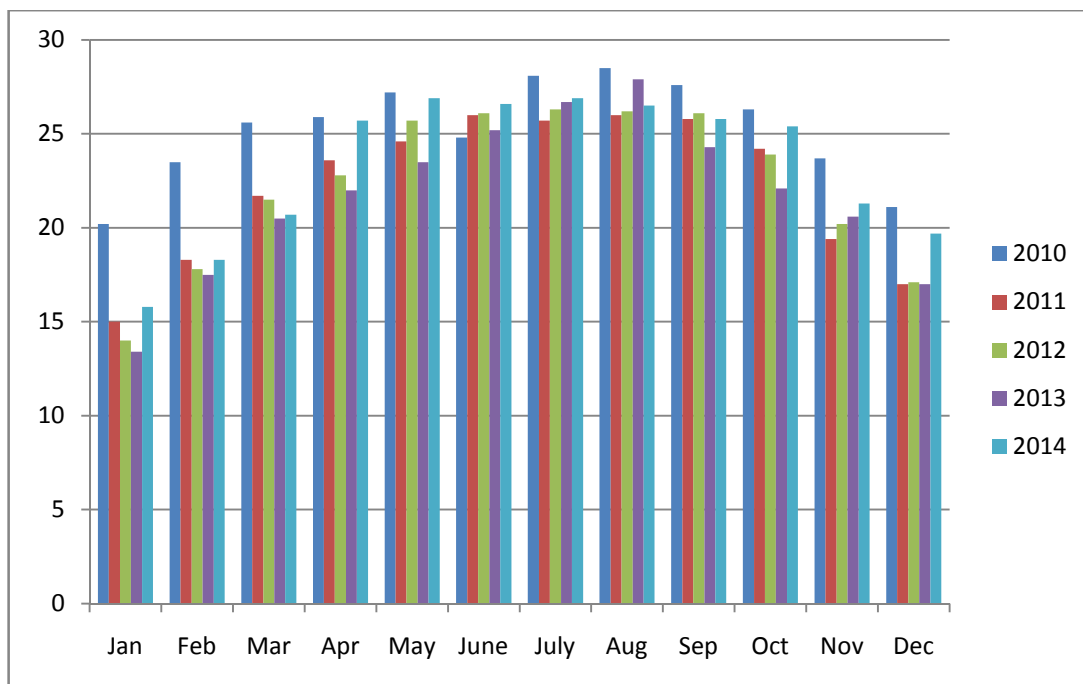


Fig. 2.6: Average maximum temperature of Mokokchung District during 2010 - 2014

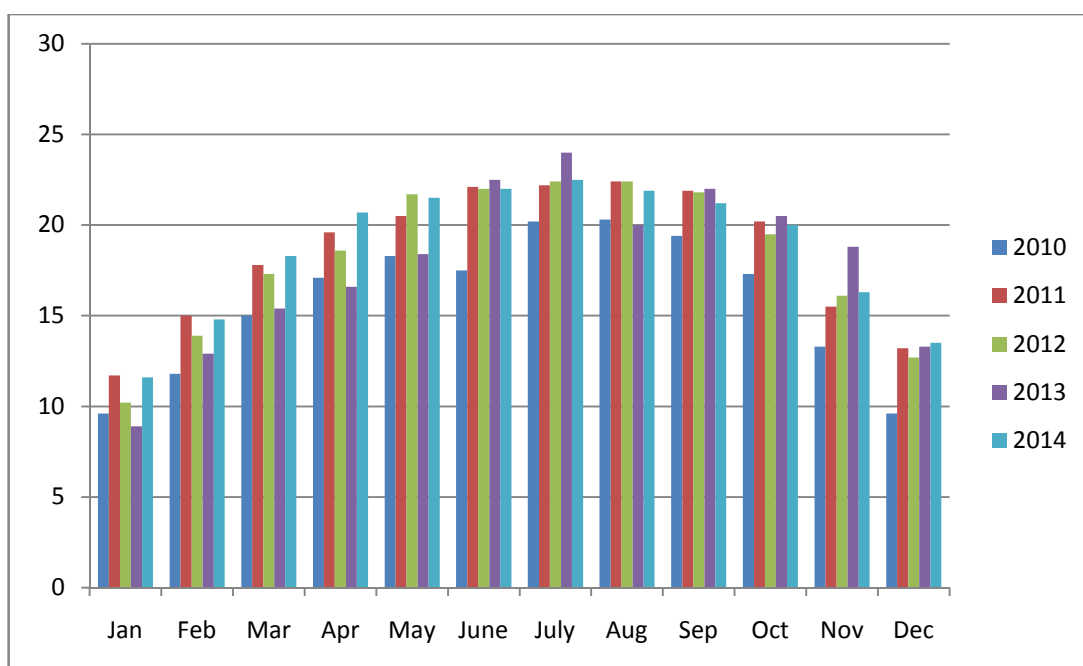


Fig 2.7: Average minimum temperature of Mokokchung District during 2010 – 2014

2.4.3 Relative Humidity

The average relative humidity remained almost constant throughout the year in 2011-2014 whereas in 2010 the lowest and highest were recorded with 48 per cent and 86 per cent respectively.

Table 2.3: Average Relative Humidity of Mokokchung District during 2010 – 2014

Month	Av. R.H % 2010	Av. R.H % 2011	Av. R.H % 2012	Av. R.H % 2013	Av. R.H % 2014
Jan	67	64	72	66	68
Feb	59	60	60	65	68
Mar	59	60	62	67	66
Apr	48	68	72	70	66
May	78	76	72	78	74
June	84	78	78	74	79
July	84	78	78	78	80
Aug	86	78	78	72	79
Sep	80	80	78	73	80
Oct	74	72	74	71	74
Nov	65	66	68	64	74
Dec	62	66	66	66	69

Source: State Agricultural Research Station, Yisemyong, 2014

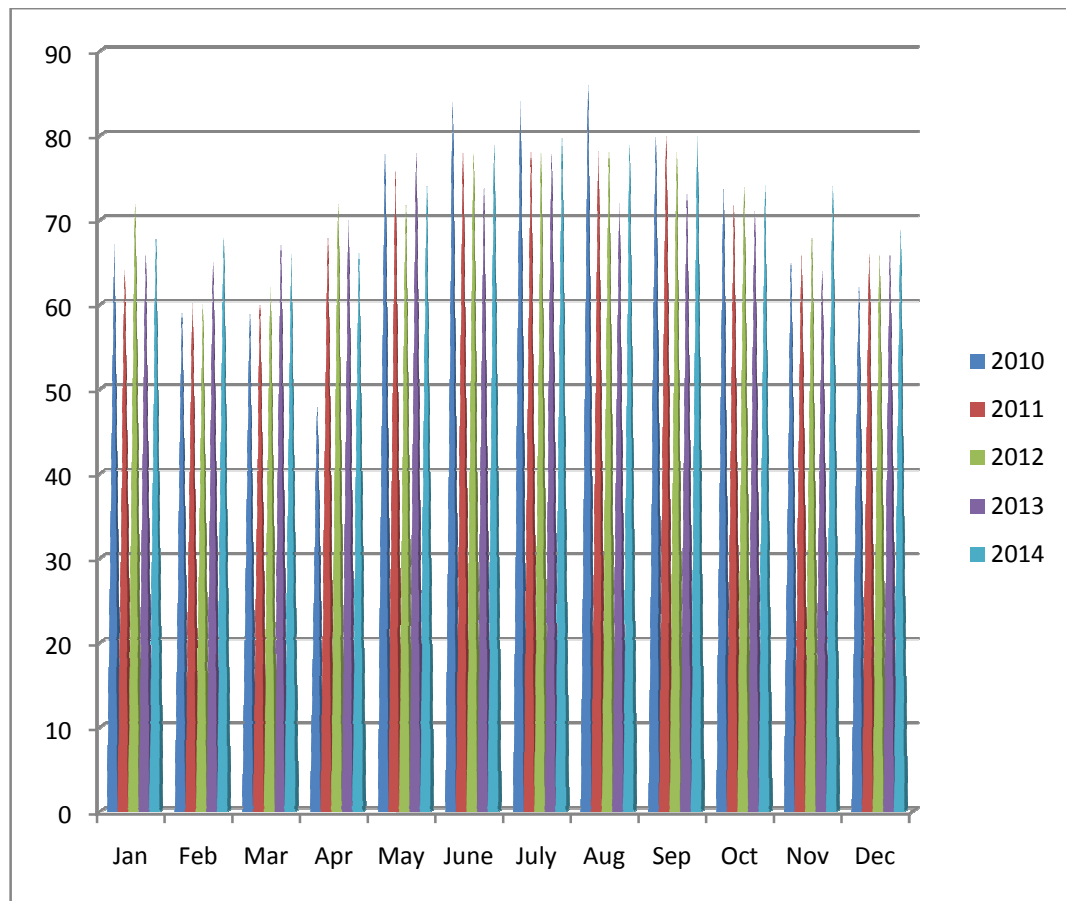


Fig. 2.8: Average Relative Humidity of Mokokchung District during 2010 – 2014

2.5 Soil

Soil is the most valuable natural resource of a nation. It is required for the growth of plants on which other living organisms depend. According to Tiwari, 2015, its nature and fertility determine the crop productivity and agricultural production through which man draws his food and essential raw materials. The process of soil formation depends on the parent rock material, climate, topography, natural vegetation, human activities and time. The rocks and its mineral composition differ from region to region as well as the climate on which depends the natural vegetation, content of humus and micro-organism. Due to all these factors the soil

differs from place to place. In Nagaland the large altitudinal variation have resulted in diversity of climate and vegetation cover which ultimately led to the formation of a variety of soil types. There are 4 orders, 7 sub-orders, 10 great groups, 14 sub groups and 72 soil families. The 4 orders are Alfisols which are found on the western flank of the state bordering with Assam, Entisols are found on the western and north western part on the low hill slopes and narrow river valley, Inceptisols are found distributed in the entire state and Ultisols are sparsely distributed in all part of the state.

The types of soil found in Mokokchung district include alluvial soil, non laterite- red soil and forest soil. The soil is acidic with pH value ranging from 3.8 to 5.7 (Soil & Water Conservation, Deptt 2005). It is loamy in texture and has good nutrient content. Alluvial soil is found mostly along the foothills and river valley of Tsurang, Changki and Tuli. The non- laterite red soil is found on the hill slopes. It is formed due to alteration of wet and dry season which lead to leaching away of siliceous matter and the red colour of the soil is due to the presence of iron oxide. Forest soils are found on the higher altitude ranging from 900m to 1800 m and it has rich humus content.

Soil Map of Nagaland

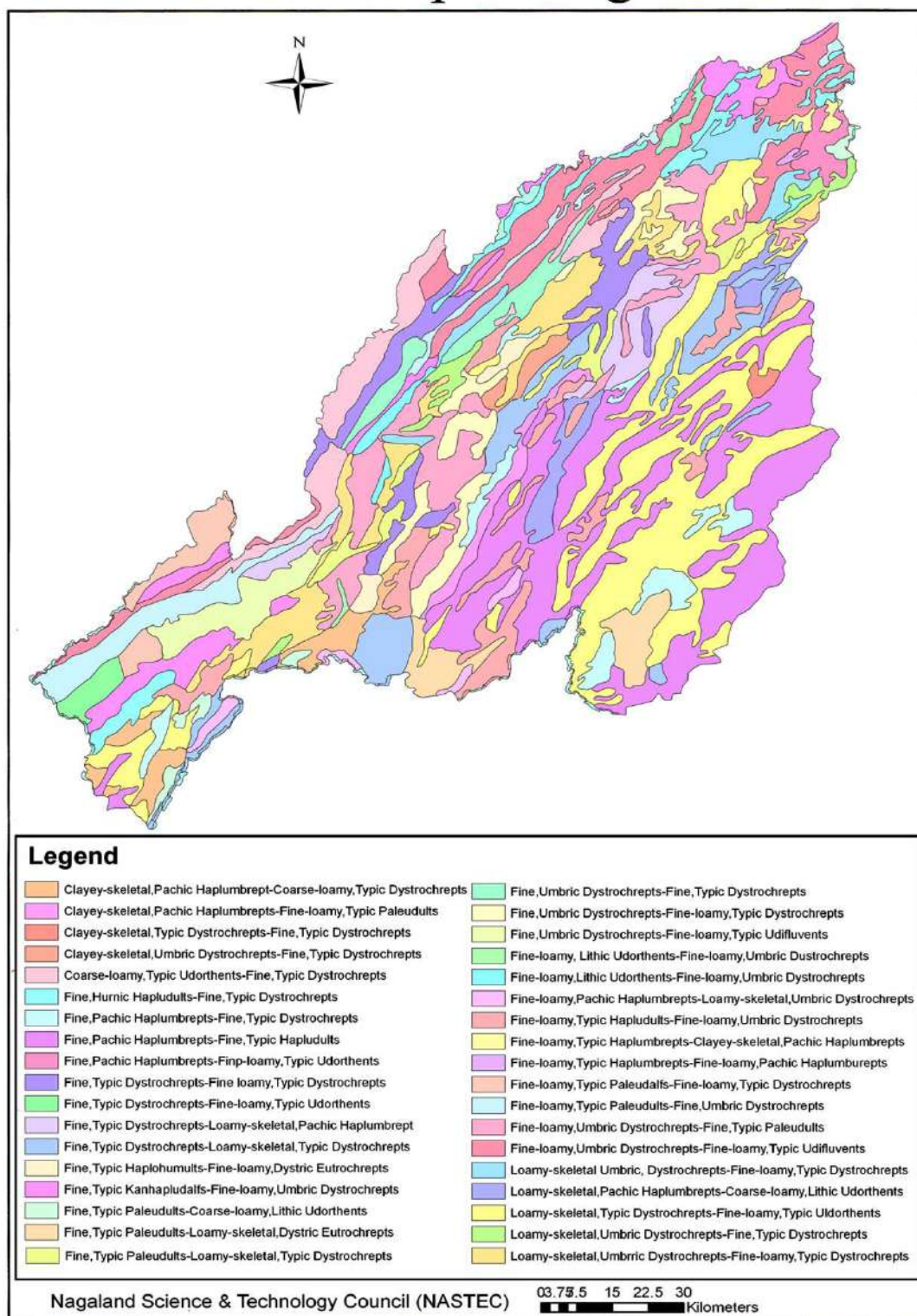


Fig. 2.9: Soil map of Mokokchung District

Landuse/Landcover of Mokokchung District 2011-2012

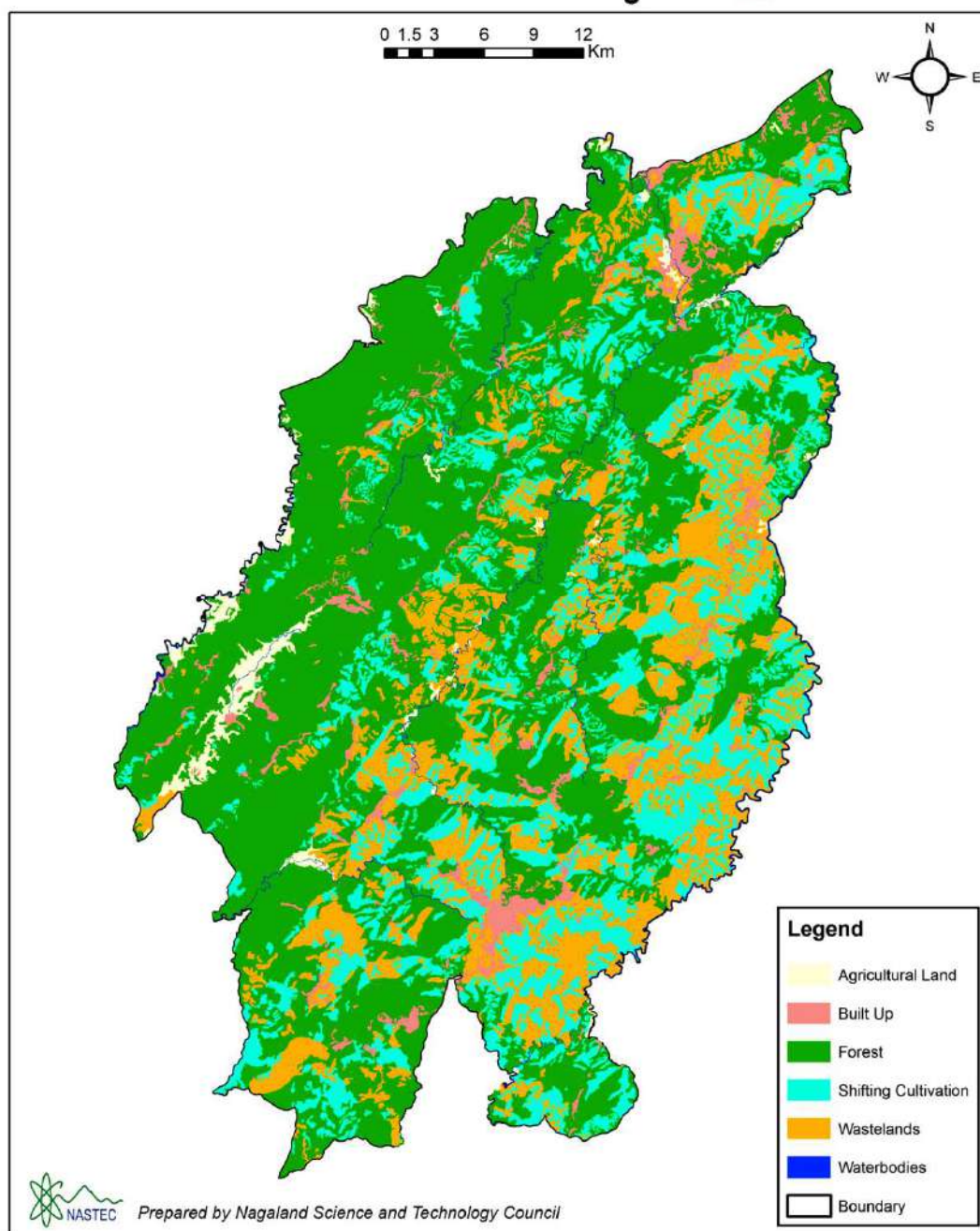


Fig. 2.10: Land use/ Land cover of Mokokchung District

2.6 Flora and Fauna

Mokokchung district falls within one of the biodiversity hotspot regions of the world. The district exhibits a variety of flora and fauna. It consists of both deciduous and evergreen forest. Most of the trees are deciduous. They shed the leaves from November onward and grow it again from March. But there are some trees which do not shed their leaves and thus keep green forever. Some of the dominant and more important trees are Champa, bonsum, amari, sam, simul, gamari, am, hollock, gorga, jamuk, walnut, urium, bogipoma, koroi, owtenga, khokan, jia poma, hilika etc. A good number of bamboo varieties, orchids, grass, shrub, herbs and medicinal plants are also found in the district.

According to India- State of Forest Report 2013 (Forest Survey of India), the forest cover in Nagaland, based on interpretation of satellite data of November 2010-February 2011 is 13,044 km², which is 78.68 per cent of the State's geographical area of 16579 km². While Mokokchung district has a total of 1360 km² forest cover accounting for 84. 21 per cent of the total land area of 1615 km². In terms of forest canopy density classes, the district has 6 km² under very dense forest, 519 km² under moderately dense forest and 835 km² under open forest. The forest cover of Mokokchung district is shown in Table 2.4 and Fig. 2.11.

Table 2.4: Forest cover of Mokokchung District

Sl. No.	Particulars	2013 Assessment (area in km ²)
1	Geographical Area	1615
2	Very Dense Forest	6
3	Moderate Dense Forest	519
4	Open Forest	835
5	Total Forest cover	1360
6	Percent of GA	84.21
7	Change	11
8	Scrub	0

Source: India- State of Forest report 2013, Forest Survey of India

Comparison with the previous assessment (satellite data of Nov 2008- Feb 2009) shows an increase of 11 km² of forest cover in Mokokchung district.

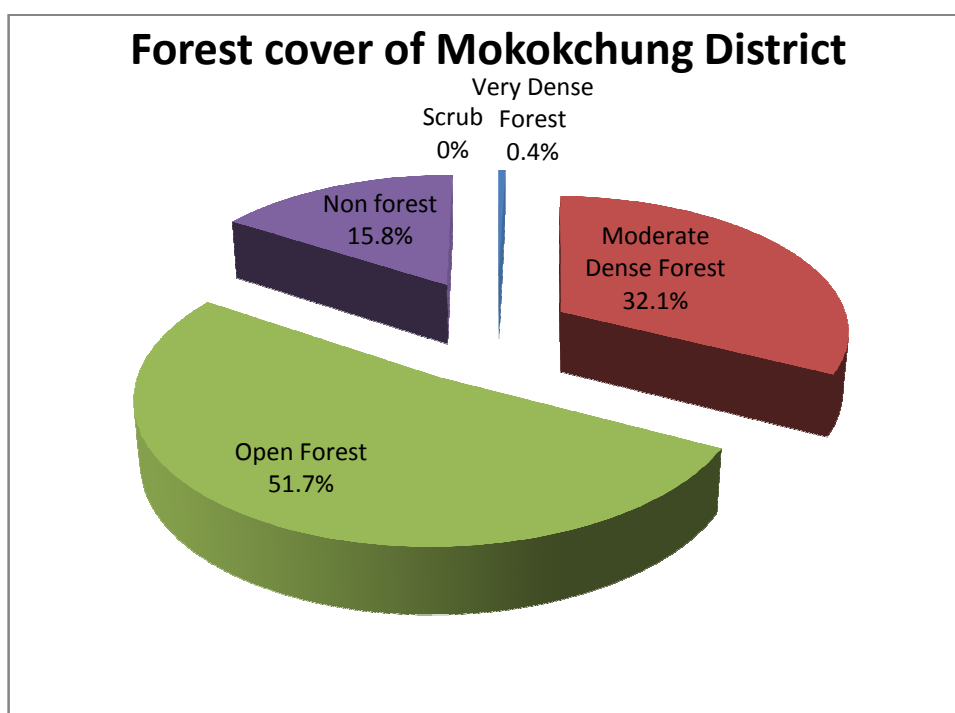


Fig. 2.11: Forest cover of Mokokchung District

The luxuriant growth of plants and forest cover has made the district home to many animal species. But due to indiscriminate killing of the animals, destruction of the forest for various developmental activities and the practice of jhum cultivation by the people of the district many of the animal species are threatened or have even extinct. However some of the birds that are still found in the district are- white vulture, black partridge, grey partridge, jungle bush gual, grey jungle fowl, common peafowl, common green pigeon, blue rock pigeon, spotted dove, roserignee, koel, spotted owlet, great horned owl, house swift, hoopoe, Malabar pied hornbill, maharatta woodpecker, common babbler etc., and some of the animals are- wild boar, barking deer, Himalayan black bear, wild goat, jungle cat, Indian porcupine, jackal, Assamese macaque, leopard, wolf, wild dog, pangolin, python, land tortoise, stag, elephant, snakes etc.

2.6.1 Causes of biodiversity degradation

One of the main causes of biodiversity degradation in Mokokchung district is the practice of jhum cultivation as it involves large scale destruction of the forest cover by cutting, burning and clearing. The predominant occupation of the people is agriculture with over 70 per cent of the population directly dependent on it. Hunting is another major factor that aided in the diminishing of wildlives. Till the 19th century the people of the district had a life centered around hunting, gathering and subsistence agriculture. Every male, both young and old took hunting as a game and during certain occasions all the male members in the village joint the hunting party. Their love for wild meat is so much that in the words of Ghosh (1979) – it may be

noted here that the people eat meat of any animal sometimes including snakes. Hunting by means of snares or traps, catapults, guns etc., is still a way of life for many of the people especially in the rural areas. In the wake of modern civilisation that brought guns to this region after the Second World War have transformed low level of traditional hunting into a much more destructive practice leading to indiscriminate killing of many of the wildlife.

2.6.2 Traditional knowledge of conservation

The Nagas in general and the people of Mokokchung district in particular have acquired various indigenous methods and techniques for the conservation of the resources especially in regard to the forest and the land. During the time of cutting of forest for jhum cultivation some of the tree trunks were left standing which have been conserved by the previous cultivators. Here only the young branches that have grown during the fallow period of the jhum field are harvested. This conservative measure have been followed from generation to generation in the most systematic manner, because an interesting fact is that the farmer who cultivated a certain plot of land in a year may not cultivate the same field in the next jhum cycle, but whoever cultivate that plot will leave those tree trunks that were left by his predecessor some 8- 10 years ago. This has been the practice of the people for a long period of time but due to increase in population and the demand of firewood and construction material coupled by the greed of the people, this tradition has lost its value and most of the fields are left barren without any forest cover and the regeneration capacity of the forest have also declined as it can be observed that today most of the landscape

appears to be devoid of the luxuriant forest cover that existed in the past. Another measure for the conservation of bamboo- a philosophical approach is that the elderly people use to say if anybody ate the bamboo shoot grown around the village they become deaf. The use of bamboo was enumerable and indispensable during the past. It was used for so many varied purposes like building material, binding ropes, making basket of different form, shape and size, water storage and as a food item in the form of bamboo shoots which was used in different ways. Therefore its protection and conservation was important. The bamboo that were planted near the village was used for emergency purpose only, so in order to save it from indiscriminate cutting, the elders had used those philosophical ideas and it proved to be affective as nobody dared to cut those bamboo shoots and instead they collected from places away from the village in the jungle.

2.7 People

Mokokchung district is mainly inhabited by the Ao Nagas, belonging to the Mongoloid stock and members of the Tibeto-Burman family. They are represented by three dialectical groups namely Chungli, Mongsen and Changki with the exception of Nokpu (Merinokpu) village who speaks a peculiar dialect similar to the Phom Nagas of Longleng district. They have been very lately absorbed in this area as the establishment of the village shows.

Other tribes have also settled in the district. One such tribe is the Sumi Nagas from Zunheboto district who have settled in the border areas of Mokokchung district in the West adjoining the plains of Assam. There are altogether four or more Sumi villages already established in the district but in recent years in relation to the establishment of village by people coming from outside the district, Ao Senden, the apex body of Ao civil organisation have passed a strong resolution that was reaffirmed in 2012 at the general conference which banned the recognition of villages established by other tribes except the Aos in Mokokchung district. There are quite a good number of people from outside of the district, apart from the other Naga tribes, a considerable number of people have also come from the mainland like the Marwari, Bihari, Punjabi, Bengali, Malayali, Tamil, Assamese, Nepali, migrants from Bangladesh etc., who works in different sectors as labourers, teachers, clerks, businessmen, etc.

2.7.1 Migration

As far as the migration is concerned, Ao traditional stories does not go beyond Longtrok (meaning six stones) which is situated at Chungliyimti village occupied by the Sangtam Nagas of Tuensang district on the Eastern side of Ao area beyond the Dikhu river at present. In Chungliyimti as the story goes, the Aos stayed for a considerable period of time, where it is believed that they enjoyed a very prosperous and peaceful life after wandering for a long period and attained a renaissance in their socio cultural life and polity.

After a long settlement at Chungliyimti the population grew so tremendously that the people had to search for more fertile land and it is said that the people had acquired the indigenous knowledge of studying the fertility of the soil through years of experience. Firstly, they used to dig a hole in the ground and then fill the hole with the same earth, if the dugout earth cannot completely fill up the hole it was considered not fertile, but if the soil fill up the hole it was considered fertile. After filling the hole if there was remainder, it meant that the soil was more fertile. Due to the need for better space and more fertile land they set off towards West and after crossing Dikhu river settled in the small valley of Aonglenden and founded Soyim village. Due to some accidental death of an Unger (Councillor or chief) they abandoned the village and shifted to Koridang wherefrom many villages of Ongpangkong ranges were founded, whereas some went back to the old place (Soyim) they once abandoned and called it Ungma which means loss of Unger. The Aos then spread all over the other five ranges of the present Mokokchung district and founded as many as 108 (2011 Census) villages. The traditional story about the origin of the Ao Naga is that according to them they sprang up from Longtrok. In course of time they crossed the Dikhu river by cane bridge leaving other people behind. These people who went ahead leaving others behind were known as 'Aor' or 'Ao' meaning going or gone, these is how the Ao people derived their name. Ancient stories does not go further beyond Longtrok, but it has been said that still some of the grand old men have in their mind faint memories and nostalgic feeling about their brethren in the East.

2.7.2 Growth of population

Remarkable changes have taken place over the past centuries in the growth and distribution of population in the State as well as in the district of Mokokchung. During its formative years after 1963 when Nagaland was declared as the 16th State of the Indian Union, only three district existed i.e., Kohima, Mokokchung and Tuensang but today the need for better administration and for proper implementation of developmental schemes, Nagaland has 11 districts with Kohima as the State capital. The growth of population has experienced high and low positive changes in the decadal variation with the exception in 2011 census which have recorded a negative decadal growth rate. Table 2.5 represents the Total population, decadal variation and percentage of decadal variation of population in the State from 1901 to 2011.

Table 2.5: Population Trend in Nagaland (1901 to 2011)

Year	Person	Decadal Variation	% of Decadal variation
1901	101550	-	-
1911	149038	+47488	+46.76
1921	158801	+9763	+6.55
1931	178844	+20043	+12.62
1941	189641	+10797	+6.04
1951	212975	+23334	+12.30

1961	369200	+156225	+73.55
1971	516449	+147249	+39.88
1981	774930	+258481	+50.05
1991	1209546	+434616	+56.08
2001	1990036	+780490	+64.53
2011	1978502	- 11534	-0.58

Source: Statistical Handbook of Nagaland, 2014

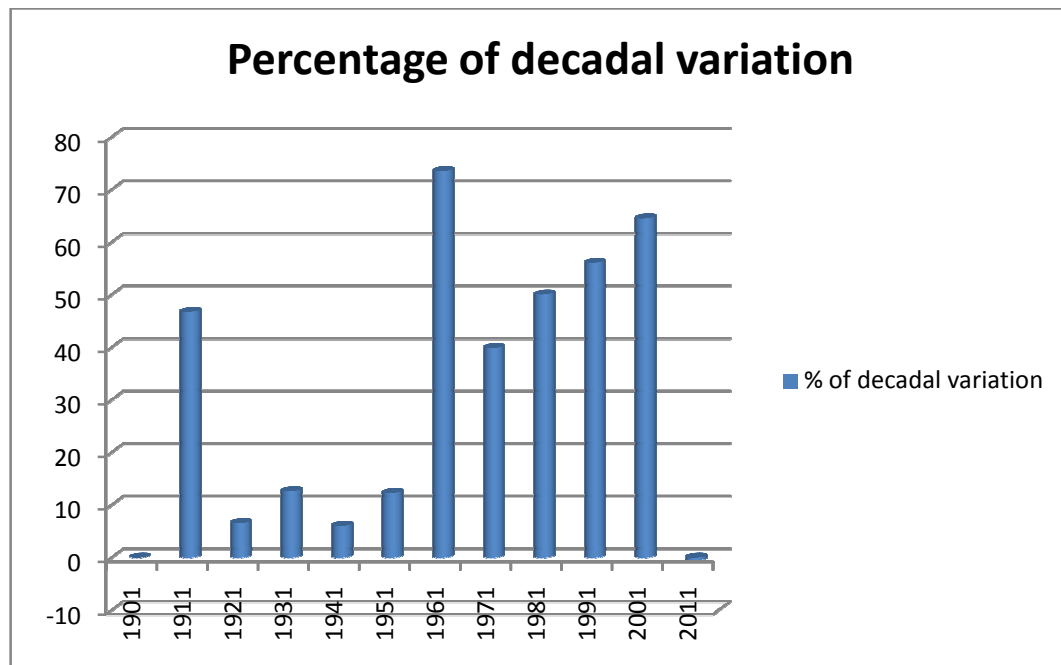


Fig. 2.14: Percentage of decadal variation

The district of Mokokchung upto 1971 census had Zunheboto and Wokha but it was only in 1973 these three districts were separated. During the 1981 census many territorial changes had taken place because after the division of the three districts, out of the total area of 1971 census, 1628 sq km was transferred to create Wokha district and 1255 sq km to form Zunheboto district. The remaining area of

1615 sq km formed the district of Mokokchung. After its bifurcation the district had eight administrative circles i.e., Ongpangkong, Kubolong, Mangkolemba, Longchem, Alongkima, Changtongya, Chuchuyimlang and Tuli according to 1981 census. At present with the inclusion of Merangmen it has 9 administrative circles. Table 2.6 represents the population status from 1981 to 2011 of Mokokchung district.

Table 2.6: Population trend and Decadal Growth in Mokokchung district

Circle/ Town	Year			
	1981	1991	2001	2011
Ongpangkong	25970	38283	50868	45824
Kubolong	9848	14167	21112	12330
Mangkolemba	8665	12128	20966	12950
Longchem	5194	9151	12849	8581
Alongkima	8764	9618	21185	11952
Changtongya	8278	12975	22878	7530
Chuchuyimlang	8828	18273	23023	17790
Tuli	10586	19238	26603	21513
Mokokchung Town	18060	24803	29332	34432
	104193	158374	232085	194622
Decennial growth rate (Percentage)	-	52.00 %	46.54 %	-16.14 %

Source: District Census Handbook, Mokokchung District, Census of India-1981;1991;2001;2011

Table 2.6 indicates a high percentage of growth rate in the Census 1991 with 52 per cent and 2001 Census with 46.54 per cent that have been attributed to many reasons of which manipulation in the population data could be one of the main reason. In 2011 Census the district showed a negative growth rate of -16.14 per cent, out of many reasons for the decrease in population the detailed and systematic collection of census data of 2011 and the drive conducted by Ao Students Conference to flush out illegal immigrants under the banner Survival Mokokchung in 2007 were notable.

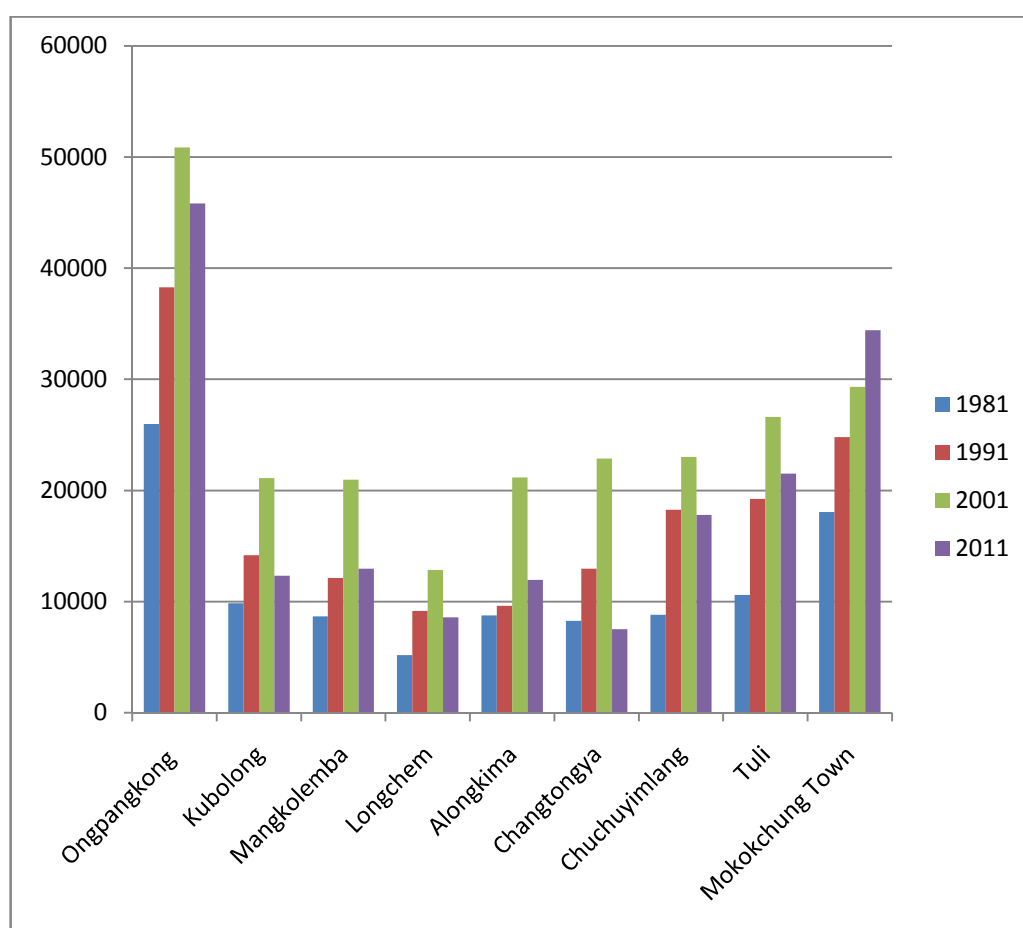


Fig. 2.15: Population trend and Decadal Growth in Mokokchung district

2.7.3 Sex Ratio

Sex ratio is the number of females per 1000 males population of a region or a country. It is important to maintain the sex ratio in any country as it represents a very crucial characteristics of welfare and socio-economic stability. In Nagaland according to 2011 census the sex ratio was 931 females per 1000 males which is below the national average of 943 females per 1000 males. The sex ratio of Mokokchung is further lower than both the National as well as the State average which is only 925 females per 1000 males.

Table 2.7: Sex ratio of Nagaland (2011 census)

Sl. No	State/ District	Person	Male	Female	Sex-Ratio
	Nagaland	1978502	1024649	953853	931
1	Kohima	267988	138966	129022	928
2	Dimapur	378811	197394	181417	919
3	Phek	163418	83743	79675	951
4	Mokokchung	194622	101092	93530	925
5	Wokha	166343	84505	81838	968
6	Zunheboto	140757	71217	69540	976
7	Tuensang	196596	101933	94663	929
8	Mon	250260	131753	118507	899
9	Peren	95219	49714	45505	915
10	Kiphire	74004	37830	36174	956
11	Longleng	50484	26502	23982	905

Source: Statistical Handbook of Nagaland, 2014

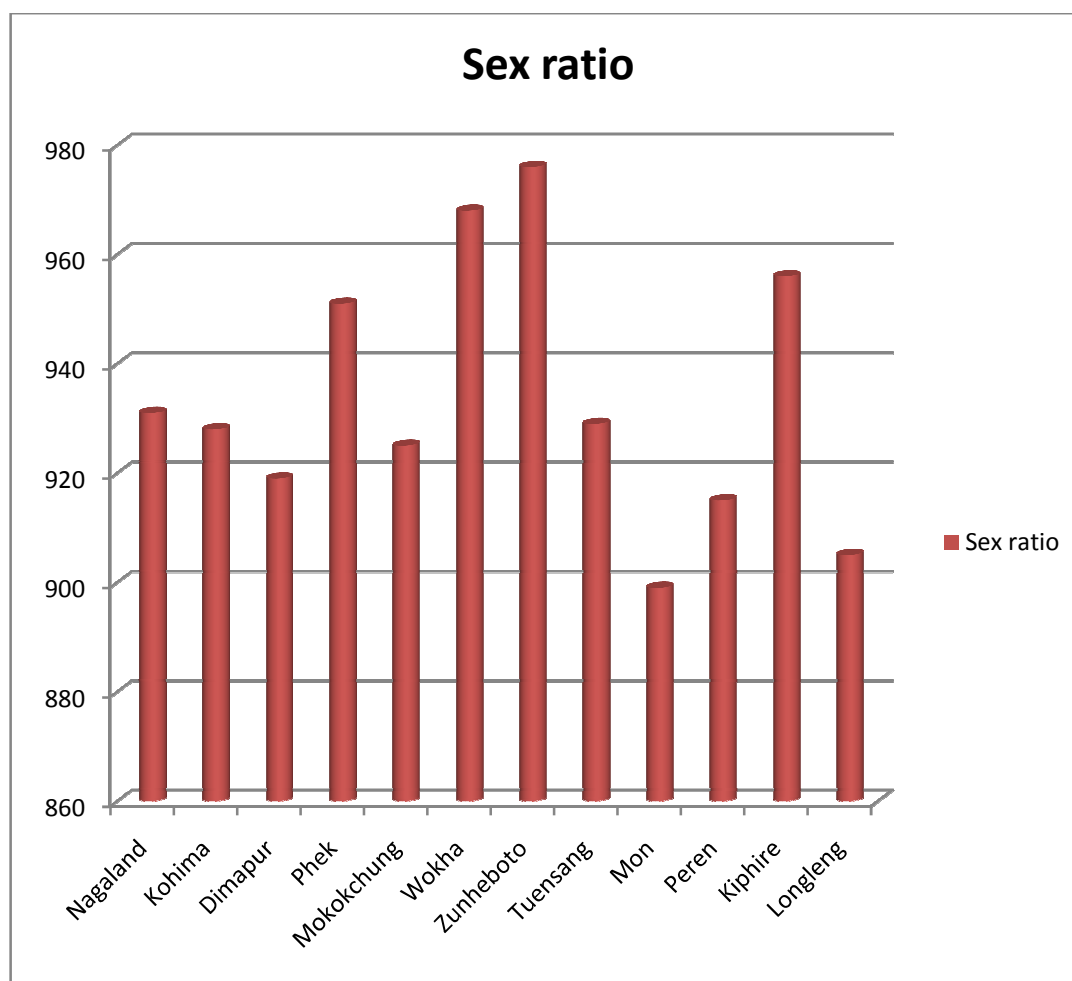


Fig. 2.16: Sex ratio of Nagaland (2011 census)

Table 2.7 and Fig 2.16 represents the sex ratio of all the districts of Nagaland where the lowest is in Mon with 889 females per 1000 males and the highest is recorded in Zunheboto with a sex ratio of 976 females per 1000 males. Out of the eleven districts of Nagaland, four district viz- Phek, Wokha, Zunheboto and Kiphire has higher sex ratio than the National average and the remaining seven district viz- Kohima, Dimapur, Mokokchung, Tuensang, Mon, Peren and Longleng has lower sex ratio than the National average.

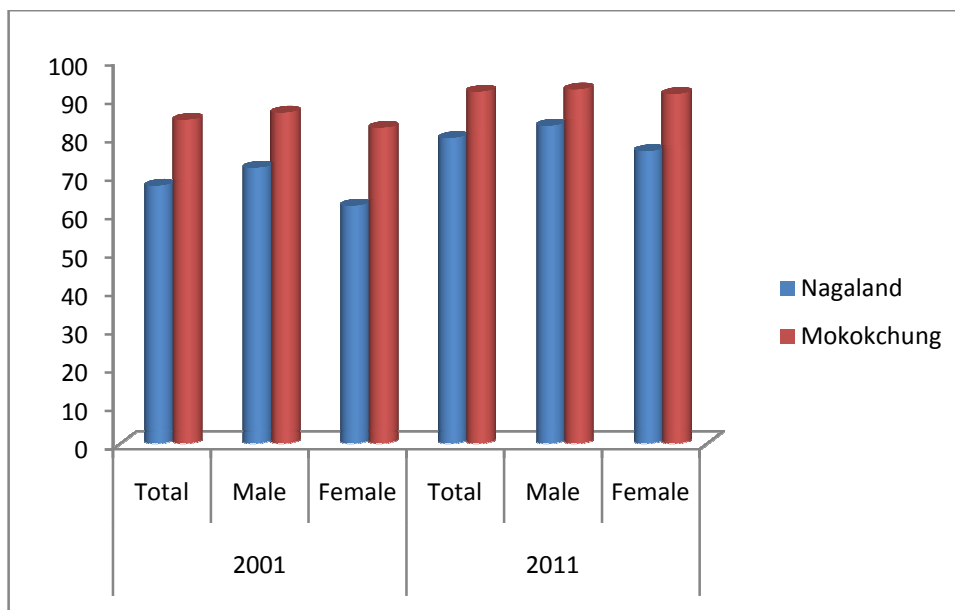
2.7.4 Education

The Ao (Nagas) of Mokokchung district are considered to be the pioneer in the field of education among the people of Nagaland. The first formal school of the Naga Hills was started in 1878 at Mokokchung district by Mrs Mary Mead Clark, wife of Dr. E.W. Clark the first Missionary to the Nagas at Molungyimsen Village. Later on, many Government and private schools started to open and today the district has 5 Government Higher Secondary Schools, 20 Government High Schools, 20 upgraded High Schools from Government Middle Schools which are not functional as High Schools till date, 53 Middle Schools, 158 Government Primary Schools. There are 10 Private Higher Secondary Schools and 45 Private High Schools in the district. The first college in Nagaland, Fazl Ali College was also established at Mokokchung in 1959. At present there are two government colleges viz- Fazl Ali College and Mokokchung B. Ed College; four private Colleges viz- Peoples College, Tuli College, Mokokchung Law College and Jubilee Memorial College; two Theological Colleges viz- Clark Theological College and Nagaland Bible College.

Table 2.8: Percentage Literacy rate of Nagaland and Mokokchung district
(Census 2001 & 2011)

State/ District	2001			2011		
	Total (in %)	Male (in %)	Female (in %)	Total (in %)	Male (in %)	Female (in %)
Nagaland	67.11	71.77	61.92	79.55	82.75	76.11
Mokokchung	84.27	86.14	82.20	91.62	92.18	91.01

Source: Statistical Handbook of Nagaland, 2010 and 2014



**Fig. 2.17: Percentage literacy rate of Nagaland and Mokokchung district
(Census 2001 & 2011)**

Table 2.8 and Fig. 2.17 represents the population of Nagaland and Mokokchung district according to the census of 2001 and 2011. The figures of percentage literacy rate in the State indicates quite a large margin between the male and the female population which was 71.77 per cent male and 61.92 per cent in 2001 showing a difference of 9.85 per cent while in 2011 it was 82.75 per cent and 76.11 per cent with a difference of 6.64 per cent, whereas in Mokokchung district during both the census years, the margin between male and female literacy rate was minimal. In 2001 census the male literacy recorded was 86.14 per cent and for the female it was 82.20 per cent with a difference of 3.94 per cent while in 2011 census it was 92.18 for male and 91.01 for the female with a difference of only 1.17 per cent which perhaps may be one of the best in the country.

2.7.5 Rural- Urban population

In 2001 the district had a total population of 232085 out of which there were 200871 rural populations that accounted to 86.55 per cent and 31214 urban population accounting to 13.45 per cent. According to 2011 Census, out of the total population of 194622 persons the district has 138897 rural populations accounting to 71.37 per cent and 55725 urban population accounting to 28.63 per cent. Table 2.9 indicate an increase of 15.18 per cent urban population during 2001-2011.

Table 2.9: Rural and Urban Population of Mokokchung District in 2001 and 2011

		2001	Percentage	2011	Percentage
DISTRICT/CIRCLE		PERSONS	%	PERSONS	%
Mokokchung	Total	232085		194622	
	Rural	200871	86.55	138897	71.37
	Urban	31214	13.45	55725	28.63
Longchem	Total	12972		8617	
	Rural	12972	100	8617	100
	Urban	-	-	-	-
Alongkima	Total	13578		11947	
	Rural	13578	100	11947	100
	Urban	-	-	-	-
Tuli	Total	29024		23377	
	Rural	29024	100	11097	47.47

	Urban	-	-	12280	52.53
Changtongya	Total	22271		17372	
	Rural	22271	100	9840	56.64
	Urban	-	-	7532	43.36
Chuchuyimlang	Total	22149		17832	
	Rural	22149	100	17832	100
	Urban	-	-	-	
Kubolong	Total	20686		12679	
	Rural	20686	100	12679	100
	Urban	-	-	-	-
Mangkolemba	Total	18685		12957	
	Rural	18685	100	12957	100
	Urban	-	-	-	-
Merangmen	Total	7053		6044	
	Rural	7053	100	6044	100
	Urban	-	-	-	-
Ongpangkong	Total	85667		83797	
	Rural	54453	63.56	47884	57.14
	Urban	31214	36.44	35913	42.86

Source: District Census Handbook, Mokokchung District, Census of India-2001 and 2011

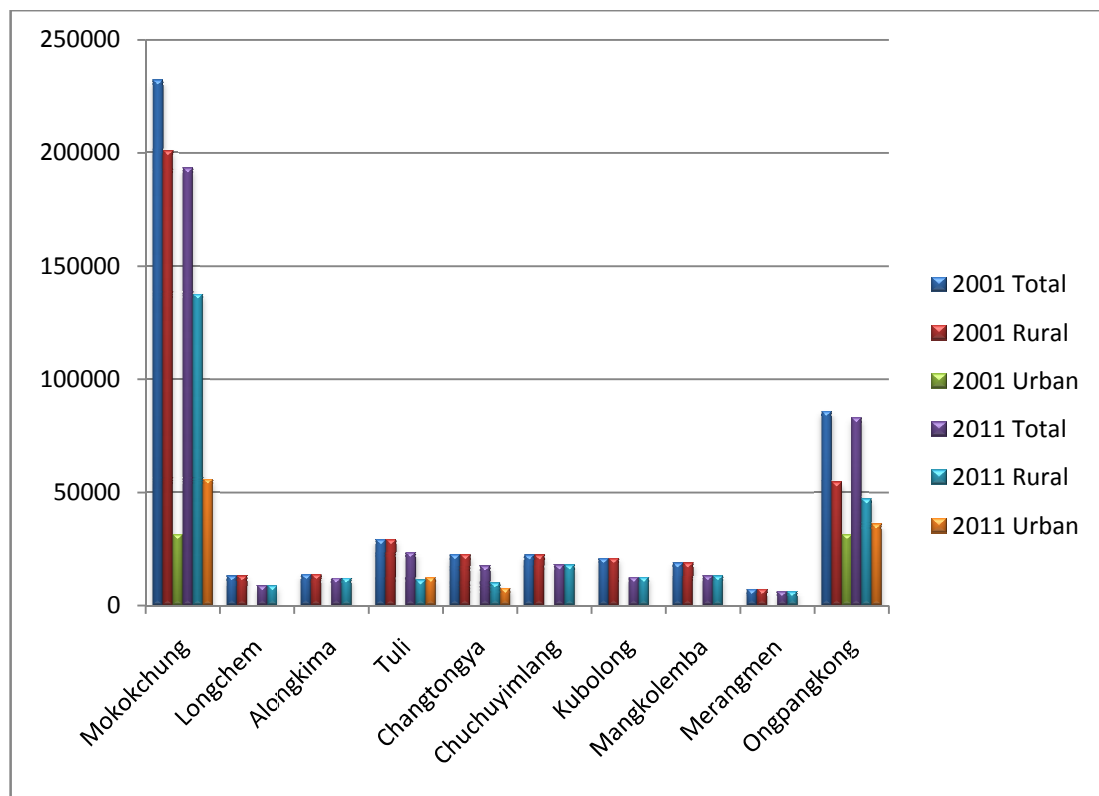


Fig. 2.18: Rural and Urban Population of Mokokchung District in 2001 and 2011 Census.

Chapter-3

Assessment of Rural Resources

3.1 Introduction

The people of Mokokchung district have been extracting various resources from the forest in the form of building materials and household utilities, firewood, eatables like fruits, vegetables, fodder for animals etc., for centuries and they have cultivated the different parts of the land which have been deeply rooted in their culture and tradition. According to Melville Pereira and Walter Fernandes (2005), - jhum cultivation is woven into the traditions and culture of the Nagas with major land use under Jhum. The favourable geo-climatic condition enriched the forest with vast biotic resources in the form of a variety of plant and animal species, bamboo, medicinal and aromatic plants. Mokokchung district has a total forest cover of 84.21 per cent of the total geographical area of 1615 sq.km. as against the State which has 78.68 per cent of the total geographical area of 16579 sq.km. The abundant resources that have grown naturally in the forest have been used by the people for consumption and have commercial value as many of the items are collected and sold by the locals in the market.

3.2 Forest resources

The forest consists of innumerable biotic resources being located in one of the biodiversity hot spot region of the world. It is to a large extent destroyed by the continuous practice of shifting cultivation but the regenerative power of the biota have enabled the forest resources to survive, though many have been threatened. The forest consist of both plants and animals but due to existing cultivation practice, rampant over exploitation of the forest and unchecked hunting many of the wild

animals have disappeared, therefore almost all the village council have imposed restriction on hunting. The study will focus on the plant resources which includes leafy vegetables, wild fruits, medicinal plants, bamboo, plantain inflorescence and other items that are used by the people in the district.

3.2.1 Leafy vegetables

Among the different types of forest products, green leafy vegetables are an important food item for the people of the district. It is eaten cooked with meat and fish or as boil. Some of the leaves are even eaten raw after being wash properly. There are many kinds of leafy vegetables that are found in the forest out of which around 11 varieties commonly used by the people are presented in the Table 3.1 below.

Table 3.1: Green leafy vegetables

Sl. No.	Local Name (Mongsen)	Common Name	Scientific Name
1	Lilem	Spanish joint fir	<i>Gnetum gnemon</i> L.
2	Kongka	Vegetable fern	<i>Diplazium esculentum</i> (Retz.)Sw.
3	Oroma	Bitter leaves	<i>Clerodendrum colebrookianum</i> Walp.
4	Longen	Rainforest spinach/ Scrub spinach	<i>Elatostema reticulatum</i>
5	Jorang	Spiny taro	<i>Lasia spinosa</i> (L.)Thwaites
6	Longsokolok	Indian Pennywort	<i>Centella asiatica</i> L.Urb.

7	Nokna	Houttunytia/Stink grass	<i>Houttuynia cordata</i> Thunb.
8	Enzi	Bhangara	<i>Wedelia chinensis</i> (Osbeck)Merr.
9	Mangwa	Shinny leaved prickly ash/Shinny bramble	<i>Zanthoxylum nitidum</i> (Lam.) DC.
10	-do-	Nepal prickly ash	<i>Zanthoxylum oxyphyllum</i> Edgew
11	Nayangnaro (M)	-	<i>Impatiens tripetala</i> Roxb.ex D.C.

Source: Field Survey, 2010- 2014

3.2.2 Wild fruits

The forest also abounds with a variety of wild fruits that are found distributed all over the district. The growth and availability of all such fruits naturally indicate that it can be nurtured and cultivated in large quantity for commercial purpose, but it is observed that only some few people in the village collect from the forest and sell it for their sustenance. 17 wild fruits have been identified during the study which are listed in the Table 3.2 .

Table 3.2: Wild fruits

Sl. No.	Local Name (Mongsen)	Common Name	Scientific Name
1	Mushijang	Burmese grape	<i>Baccaurea ramiflora</i> Lour
2	Tangma	Chinese gall/Nutgall/Nut gall Tree	<i>Rhus semialata</i> Murr.

3	Liher	Indian goosebeery	<i>Emblica officinalis</i> Gaentn.
4	Kahjang	Common walnut	<i>Junglan regia</i> L.
5	Pahkojang	Tahitean apple/Golden apple	<i>Spondias dulcis</i> L.
6	Surajang	Major Jenkins palm fruit	<i>Livistona jenkinsiana</i> Griff.
7	Arrjang	Bet/Vigagra palm	<i>Calamus erectus</i> Roxb.
8	Ningkahjang	Balliric myrobalan	<i>Terminalia bellirica</i> (Gaertn) Roxb.
9	Asajang		
10	Tsujembijang	-	-
11	Sunem	-	-
12	Mezula	-	-
13	Mutiong	-	-
14	Aimalobijang	-	-
15	Tangshi	-	-
16	Monguzuno	-	-
17	Hokmi	-	-

Source: Field survey, 2010- 2014

3.2.3 Medicinal plants

The favourable climatic conditions have resulted in the growth of luxuriant vegetations that have immense wealth of medicinal plants. India has 16 Agro-climatic zones, 45000 plant species and 15000 medicinal plants that include 7000 plants used in Ayurveda, 700 in Unani medicine, 600 in Siddha, 450 in Homeopathy and 30 in modern medicine (Deorani and Sharma, 2007). The existence of such great varieties of plants has been a source of medicine used for treatment of various

diseases for a long period of time. In this extreme North Eastern corner of India the people with their indigenous knowledge have also used a variety of plant species as medicine which have been handed down orally from generations to generations. It has been observed that almost all of the plants have medicinal value for treatment of one or the other disease, the knowledge of which has been acquired through experience. Various professional and scholar have studied the medicinal plants of the State which have shown tremendous result. Deorani and Sharma (2007), have identified 358 medicinal plants in the State. Nagaland Bio Resource Mission have also identified 650 plant resources all having medicinal value. The climatic condition and the vegetation cover of the State exhibits a diverse character and thereby the district of Mokokchung has many of the species widely distributed. Some of the important and common medicinal plants used by the people of the district are-

1. Indian penny wort (*Centella asiatica* L.) Urb.- It is used as tonic, diuretic, stimulant and used for treatment of skin disorder, rheumatism.
2. Periwinkle (*Catharanthus roseus* Linn.) G.- It is used for the treatment of diabetes, hypertension, leukaemia, kidney problem.
3. Nutgall (*Rhus semialata* Murr.)- It is used in the treatment for stomachache, food poisoning, allergy, indigestion.
4. Stink grass (*Houttuynia cordata* Thunb)- It is used for stomachache, cholera, dysentery, arthritis.
5. *Impatiens tripetala* Roxb. Ex Dc.- The plant is used for treating gonorrhoea and urinary problems.
6. Garden mint (*Mentha spicata* L)- It is used as a stimulant, diuretic and used to treat jaundice, throat and uterus infection, toothache.

7. *Clerodendrum cordatum* D. Don- The leaves are used as laxative, antiseptic, anti- inflammatory, tonic in cough and bronchitis.
8. Asparagus (*Asparagus racemosus* Willd.) - It is used to treat diarrhoea, fever, urinary problem and hyper acidity.
9. *Bidens pilosa* Linn. - This plant is used for treatment of leprosy, skin disease. The seed are used as anthelmintic.
10. Pigeon pea (*Cajanus cajan* Linn.) Mill. – The leaves of this plant are used as astringent, diuretic, laxative. It is also used for treatment of jaundice.
11. Tea (*Camellia sinensis* Linn.) Kuntze.- It is used as astringent, appetiser, carminative, diuretic, digestive and nerve tonic,.
12. Hemp (*Cannabis sativa* Linn.)- It is used as sedative, intoxicant, analgesic, antibacterial, narcotic, stomachache, stimulant.
13. Wild Spinach (*Chenopodium album* Linn.)- It is used as a carminative, laxative, anthelminthic, diuretic, blood purifier.
14. Chinese cinnamom (*Cinnamomum aromaticum* Nees)- It is used as carminative, astringent, aromatic.
15. Japanese lemon (*Citrus limon* Linn.) Burm.f.- It is used as thermogenic, digestive, laxative, anthelmentic.
16. Bush willow (*Combredum albidum* G. Don.)- It is considered to contain anti bacterial and anti cancer properties.
17. Turmeric (*Curcuma angustifolia* Roxb)- It is used for the treatment of bronchitis, asthma, fever, jaundice, leucoderma.
18. *Drymaria cordata* (Linn.) Willd.- It is used as antidote, appetiser, blood purifier.

19. *Elsholtzia blanda* Benth.- It is used for the treatment of kidney , urinary bladder disorder, sores and choleric diarrhoea.
20. *Eupatorium adenophorum* Spreng. – The leaves of this plant is used for the treatment of malaria, stomachache. It has haemostatic and antiseptic properties.
21. Soya bean (*Glycine max* L. Merr.) – It is used to treat allergies, skin and eye diseases.
22. Red sorrel (*Hibiscus sabdariffa* Linn.)- used for dyspepsia and stomach disorder.
23. Balliric myrobalan (*Terminalia bellirica* (Gaertn) Roxb.)- The fruit is used as astringent, antiseptic, tonic, laxative, antipyretic, and narcotic. It is also used for treatment of piles, cough etc.
24. Air plant (*Kalanchoe pinnata* Lam.) Pers.- It is used for treating burns, amoebic dysentery.
25. Spiny taro (*Lasia spinosa* L. Thwaites)- It is used to treat burns, throat infection and the leaves expels worm from the body.
26. Japanese weed (*Mikania cordata* Burm)- The leaves are used to stop bleeding. It is also used for the treatment of gastritis, insect bites, skin irritation.
27. Sensitive plant (*Mimosa pudica* Linn.)- It is used as antiseptic, blood purifier. The decoction of leaves is used for treating diarrhoea, skin diseases, pile problems and dissolving kidney and gall bladder stones.
28. *Ocimum tenuiflorum* Linn.- It is used to treat malarial fever, digestive problems, bronchitis, skin diseases.

29. Indian gooseberry (*Phyllanthus emblica* L)- It is a natural source of vitamin C. The fruit is used to treat loss of appetite, digestive disorder, jaundice, anaemia, cardiac disorder, piles and used as tonic, diuretic, cooling, laxative.
30. Clover/ Indian sorrel (*Oxalis corniculata* Linn.)- It is used for the treatment of scurvy, dysentery, diarrhoea and also use as appetiser.
31. Ginseng (*Panax quinquefolium* Linn.) - It is used to treat loss of appetite, asthma, insomnia, headache, cancer. It gives stamina and concentration.
32. *Perilla frutescens* (Linn.) Britton- It is used to treat morning sickness during pregnancy, cough, cold, headache, food poisoning, nausea.

3.2.4 Bamboo

There are more than 1200 species of 50 genera of Bambusoideae in the world, mainly distributed in tropical and subtropical areas (Qisheng et al.). India has the largest area under bamboo in the world estimated around 11.36 million hectares. It has 136 species of bamboo across 22 Genera. According to FAO, total area under bamboo cultivation is 11,361 hectares as on 2005. Bamboo is the fastest growing woody plant in the world and has been critical for the survival of mankind in general and the Naga people in particular. Bamboo can be grown on diverse climates from temperate to tropical regions. About 40 million hectares of the earth are covered with bamboo, mostly in Asia. Soon after shoot emergence, the new cane reaches its full height in just 8-10 weeks. Each cane reaches maturity in 3-5 years. Bamboo can be repeatedly re-harvested with no harm to the surrounding environment. It regenerates after being cut without the need for replanting. It is a sustainable and efficient crop.

Bamboo helps in reducing CO₂ and generates upto 35 per cent more oxygen than equivalent stands of trees thus helping in reducing global warming which is a major issue in our present day. Water-use efficiency of bamboo is twice that of other trees. These make bamboo more able to handle harsh weather conditions such as drought, flood and high temperatures. These facts make bamboo a sustainable and versatile resource.

In terms of forest canopy density classes, out of 13044 Km² of forest cover the State has 1298 km² area under very dense forest, 4736 km² area under moderately dense forest and 7010 km² area under open forest (Forest Survey of India, 2013).

The extent of bamboo bearing area in the forest of the State is 4902 km². Around 46 species of bamboo are known to exist in Nagaland. So far, scientifically managed bamboo plantation cover an area of 13,982 hectares (NBDA). Some of the species of bamboo common in Nagaland and the purposes for which they are used are as follows:

Table 3.3: Bamboo species commonly found in Nagaland

Sl. No	Species	Uses
1	<i>Bambusa tulda</i>	Construction, industrial use, handicraft, shoot, pulp
2	<i>Bambusa balcooa</i>	Construction, pulp, implement, fodder
3	<i>Dendrocalamus hamiltonii</i>	Handicraft, shoot
4	<i>Dendrocalamus giganteus</i>	Construction, shoot

5	<i>Dendrocalamus latiflorus</i>	Construction, shoot
6	<i>Schyzostachyum dullooa</i>	Weaving, mat making, shoot

Source: Nagaland Bamboo Development Agency, 2009.

Table 3.4: Some identified bamboos of Nagaland

1. <i>Bambusa tulda</i>	21. <i>Dendrocalamus sikkimensis</i>
2. <i>Bambusa alemtemsii</i>	22. <i>Dendrocalamus strictus</i>
3. <i>Bambusa balcooa</i>	23. <i>Melocana baccifera</i>
4. <i>Bambusa cacharensis</i>	24. <i>Neomicrocalamus</i>
5. <i>Bambusa jaintiana</i>	<i>androponofolius</i>
6. <i>Bambusa multiplex</i>	25. <i>Neomicrocalamus manii</i>
7. <i>Bambusa multiplex riveonurum</i>	26. <i>Phyllostachys manii</i>
8. <i>Bambusa nagalandiana</i>	27. <i>Schizostachyum polymorphum</i>
9. <i>Bambusa nutans</i>	28. <i>Schizostachyum dullooa</i>
10. <i>Bambusa pallida</i>	29. <i>Schizostachyum munroi</i>
11. <i>Bambusa vulgaris</i>	30. <i>Schizostachyum capitatum</i>
12. <i>Bambusa vulgaris straita</i>	31. <i>Schizostachyum fuschianum</i>
13. <i>Bambusa vulgaris wamin</i>	32. <i>Schizostachyum palladium</i>
14. <i>Cephalostachyum longwanum</i>	33. <i>Sinarundanaria prainii</i>
15. <i>Chimonobambusa callosa</i>	34. <i>Sinarundanaria elegans</i>
16. <i>Dendrocalamus hamiltonii</i>	35. <i>Sinarundanaria graffithiana</i>
17. <i>Dendrocalamus giganteus</i>	36. <i>Sinarundanaria hirsuta</i>
18. <i>Dendrocalamus latiflorus</i>	37. <i>Sinarundanaria nagalandiana</i>
19. <i>Dendrocalamus hookerii</i>	38. <i>Sinarundanaria roloana</i>
20. <i>Dendrocalamus patellaris</i>	39. <i>Thyrsostachys oliveri</i>

Source: Nagaland Bamboo Development Agency, 2009.

Table 3.5: Bamboo bearing area by density in recorded forest area
(area in km²)

Recorded forest area	Pure bamboo	Dense bamboo	Scattered bamboo	Clumps hacked	Bamboo regeneration	No Bamboo
9222	101	3064	1644	65	28	4320

Source: India State of Forest Report, 2011. Forest Survey of India

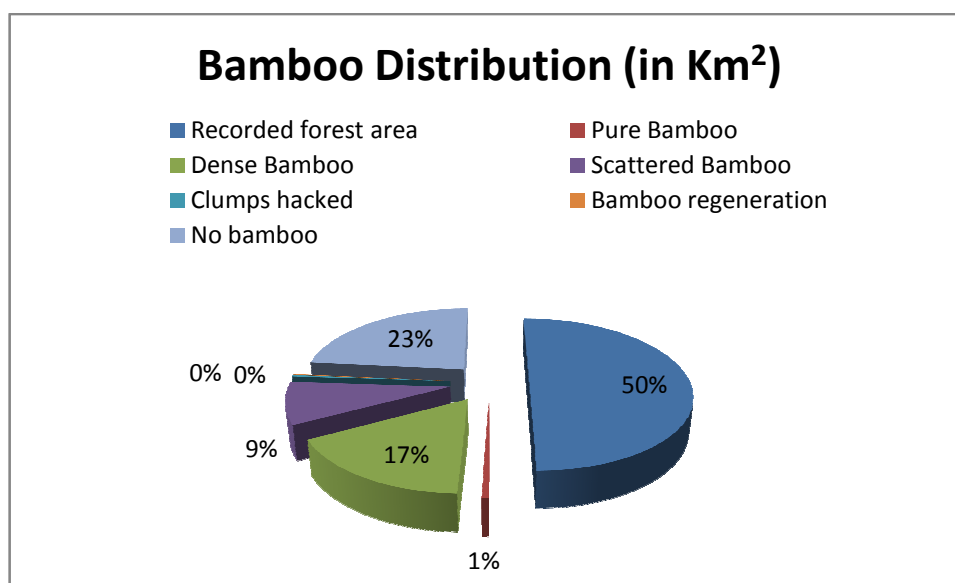


Fig 3.1: Bamboo distribution (area in km²)

The utility of bamboo bio-resource for the Nagas in general and the Aos in particular is indispensable. It is used as construction materials in many ways. Some species are used as a whole without splitting in the form of pillar as well as support in the roof and ceiling where there is scarcity of wood. Some species are used for binding purpose which can be produce when the bamboo is around one and half year old. The young bamboo is split into small pieces and made into binding material. It can be preserved for many years when kept near the fire place in the kitchen. During

the olden times in the absence of steel and aluminium utensils and plastic and synthetic materials, the product of bamboo was used; the people depended on bamboo for making baskets in different form, shape, size and as storage material, making of mat etc. Some species are used for making wall and ceiling material where the bamboo is cut open into half and split open and weaved together depending on the requirement and the size of the building. Some species were used for carrying and storing water as well as for making channel from the roof to collect water during rainy season. At recent times modern machinery is used to produce decorated item like chair, benches, mug, kitchen articles etc. The abundance of this bamboo resource in the State has encouraged the government to set up a paper mill at Tuli in Mokokchung district which was defunct and is now in the process of reviving the production. Bamboo charcoal is another very important product which is used for various purposes. Another important aspect relating to the utility of bamboo is that the shoot is used as a delicacy by the people. It can be used as a fresh food item or preserved by grinding it and separate the juice which is also used for adding flavour in the preparation of food. The solid paste produce is kept in container which is also used as a taste maker in different curry. It is also dried in the sun which can be preserved and use for a longer period without getting spoilt.

3.2.5 Plantain inflorescence

Plantain flowers (inflorescence): The plant of this flower grow very well all over the district. This flower is a delicacy for the people which are eaten cooked as curry. Since no literature was available for the identification of the types of this

plant, local names are used for most of these items. There are about 6 varieties of the plantain flowers available in the district, viz. Banano Nano (Yarang in Mongsen), Bronze Banana (Sula), Poksok, Lanak, Larep, Latsa. All the varieties are eatable but Lanak has a bitter taste. The people also ate the young parts of this plant taken from three of the varieties viz- Latsa, poksok and Larep. These plantain flowers produce banana but those are not eatable.



Plate 3.1: Yarang (M) plantain inflorescence



Plate 3.2: Sula (M) plantain inflorescence



Plate 3.3: Poksok (M) plantain inflorescence



Plate 3.4: Lanak (M) plantain inflorescence



Plate 3.5: Larep (M) plantain inflorescence



Plate 3.6: Latsa (M) plantain inflorescence

Apart from the leafy vegetables, wild fruits, medicinal plants, bamboo and plantain inflorescence there are several other resources extracted from the forest that are used by the people such as fan palm, broom grass, Chinese cinnamon, walnut, different varieties of mushroom like Jungko (Mongsen), mani (Mongsen), zena (Mongsen), avo narong (Mongsen), onghok (Mongsen) and various other fodder plants.

3.3 Agricultural Resources

Agriculture is the deliberate effort to modify a portion of earth's surface through the cultivation of crops and the raising of livestock for sustenance or economic gain (Rubenstein, 2003). Agriculture remains the most important sector of the district economy as more than 71.37 per cent of the population are rural. In spite of the difficult terrain condition, the people of this district have toiled hard through the ages by cultivating the different part of the land. But the urge for a better living condition and the movement of population from rural to urban places, things are changing very fast. The agricultural work force of the district in Table 3.6 indicate a decadal decrease of 8.32 per cent of total agricultural workers, while there was a decrease of cultivators by 7.98 per cent and the percentage of agricultural labourers also decreased by 0.34 per cent during the same period i.e., 2001-2011.

Table 3.6: Agricultural work force in Mokokchung District

Sl.No.	Categories	2001			2011		
		Total	Male	Female	Total	Male	Female
1	Total worker	108779	60612	48167	81046	48355	32691
2	Cultivators	65366	32547	32819	42236	21940	20296
3	% of cultivators to total workers	60.09	53.70	68.14	52.11	45.37	62.08
4	Agricultural Labourer	6892	3109	3783	4863	3013	1850
5	% of Agricultural labourer to total workers	6.34	5.13	7.85	6	6.23	5.66
6	Total agricultural workers (2+4)	72258	35656	36602	47099	24953	22146
7	% of Agricultural workers to total workers	66.43	58.83	75.99	58.11	51.6	67.74

Source: Statistical Handbook of Nagaland, 2010 and 2014

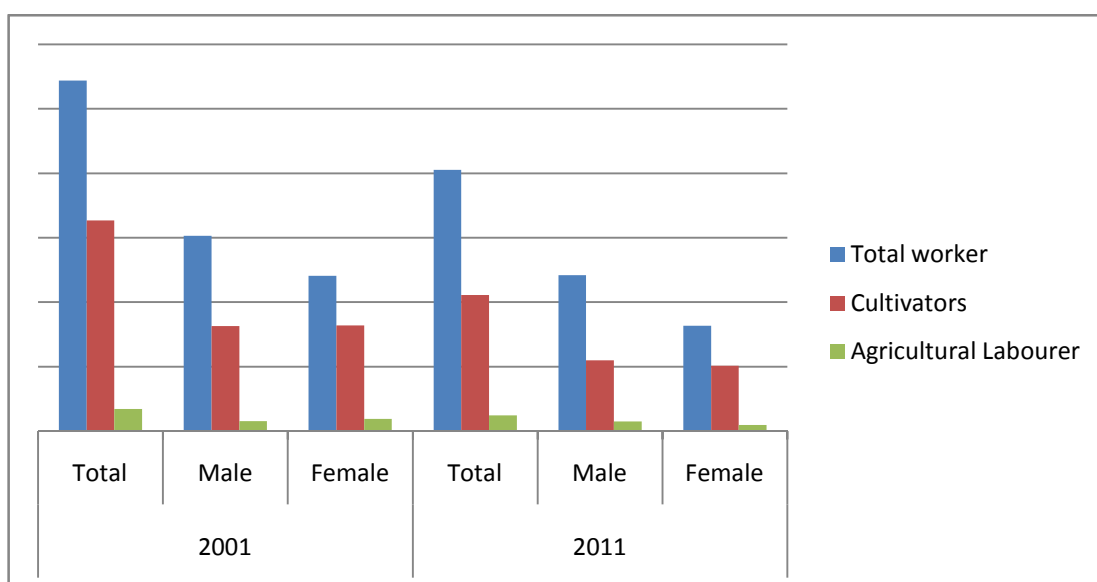


Fig 3.2: Agricultural work force in Mokokchung District

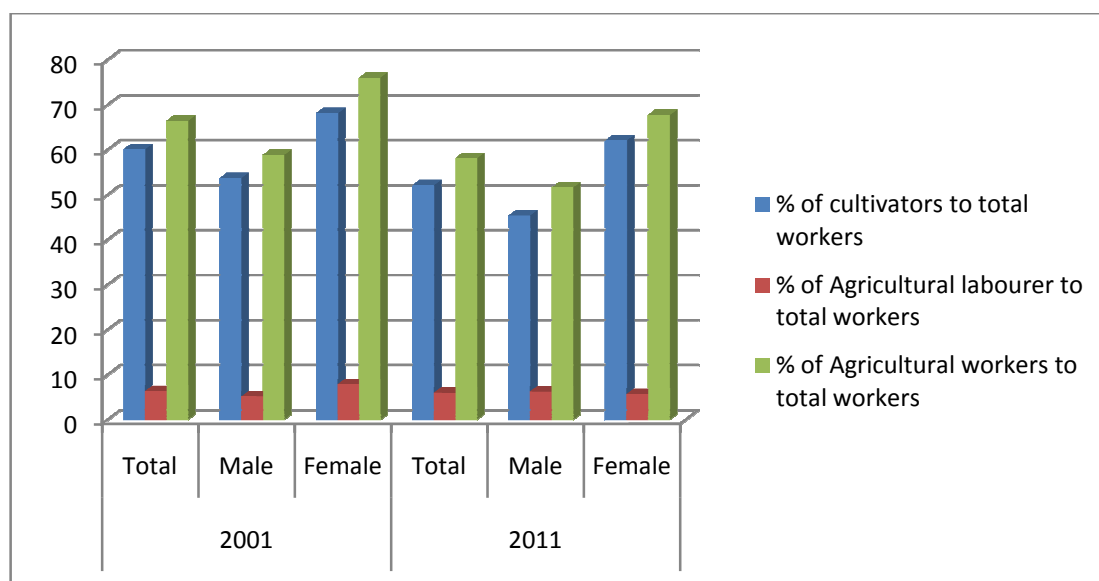


Fig 3.3: Percentage of agricultural work force

The decrease of total agricultural workers in the district can be attributed to various reasons among which the important ones are the migration of the rural population to urban areas in search of better opportunity and change of occupational pattern for a better living condition. The villages located near the urban centres show high tendency of such movement and the change of occupation from agriculture to other activities. Whereas in areas that are favourable for cash crop cultivation, people have started to take up different types of farming like horticulture, tea, rubber, vegetables etc. The impact of urbanisation in the occupational structure of the rural population and its effect on the jhum cycle have been observed at Khensa village in Ongpangkong range, the findings of which are discussed in detail. Khensa village located at an altitude between 480m- 1258m above sea level is situated to the West of Mokokchung town with a total geographical area of 3625 ha (Deptt. of Soil and Water Conservation, Govt. of Nagaland). There are 550 households (2011 census) out of which about 62 household constitute the farming families. The role of clan

permeates all socio-political and economic spheres of life as it functions as a unit of collective responsibility and source of identity. The traditional political organization is egalitarian and the village is administered by a Village Council constituting representatives (tatar) from all the clans who assume office on rotational basis. The Council is the highest body of authority on all matters. In Khensa village, there are three khels (wards) namely Jungli mepu, Yimpang mepu (upper khel) and Yimlang mepu (lower khel). Land is largely owned by the clans. The very nature of ownership determines the allocation of jhum fields. All areas designated for jhumming are segregated into several 'pouk'. A pouk is a large tract of land usually located between two streams which are used for cultivation in a cyclic pattern. Each pouk comprises of numerous jhum fields called 'lumang'. Every year a pouk is cultivated and on the 1st week of November, the clan elders allocate the fields and decide the time for commencement of the clearing and burning of the jungle. Once the fields are harvested, a new pouk is selected and sites are then shifted the following year, while the old site is cultivated for a second year before it is totally abandoned. Eventually after cultivating the numerous pouk in a well established sequential order, the cultivators return to the first pouk thus beginning a new cycle. The period of complete rotation or cycle may vary from village to village between 5 to 14 years given the size of population and territory.

The jhum areas consist of 18 pouk shared among Yimpang (Upper Khel) and Yimlang (Lower Khel). The farmers from Jungli Khel cultivate in both the jhum fields along with the other two Khels. The 18 pouk comprises of a total of 204 jhum fields with 106 fields in Yimlang (lower khel) and 98 jhum fields in Yimpang (upper

khel)- Table 3.7 & Table 3.8. Interestingly certain fields in all the pouk were traditionally set aside for cultivation of cotton which was called "Kumba lumang" making the villagers self reliant for weaving their clothes in the past, however this practice has been abandoned as the people can buy thread and yarn from the market that are available with more varieties, thus these cotton fields are today either a part of a pouk which is cultivated by some farmers or kept as a reserve forest. In both Yimlang and Yimpang pouk the clans from each khel have their fields as for instance, in the case of Sali pouk which was earlier a part of Bensong pouk the cultivation is done combined in a year. Another practice that the people of the village adopt is that even at times when a greater part of a pouk allotted for a certain year remains uncultivated due to decrease in the number of cultivators, the whole portion of that pouk is left behind and they move to the pouk allotted for the next year by following the sequential order.

Table 3.7: Distribution of Jhum fields in Khensa village, Yimlang Pouk

Sl. No	Name of pouk	Number of fields	Cotton fields	Frequency of cultivation per cycle	No. of fields affected by urbanization
1.	Bensong	21	4	2	Nil
2.	Longmi-Akong	5	2	1	Nil
3.	Tongdensumang	8	2	1	Nil
4.	Ajen	16	2	2	Nil
5.	Yiremmongso	7	2	1	Nil
6.	Jenjang	9	1	1	Nil
7.	Wazako	9	3	1	Nil
8.	Mapak	6	2	1	Nil
9.	Aningkong	6	1	1	Nil

Source: Field Survey, 2012

Table 3.8: Distribution of Jhum fields in Khensa village, Yimpang pouk

Sl. No	Name of pouk	Number of fields	Cotton fields	Frequency of cultivation per cycle	No. of fields affected by urbanisation
1.	Sali	This pouk is a part of Yimlang (Lower Khel) & cultivate combined.		1	Nil
2.	Ajen	13	1	Partial	2
3.	Kupyong	6	1	Partial	4
4.	Archemok	16	3	Nil	14
5.	Metsutsung	10	1	1	Nil
6.	Samitsuk	9	1	1	Nil
7.	Yajen Temaba	9	1	1	Nil
8.	Yajen Tepokba	11	2	1	Nil
9.	Molungkong	11	3	1	Nil

Source: Field Survey, 2012

Khensa village is bounded by two rivers i.e., Milak river flowing on the north in a North East to North West direction forming the boundary with Mopungchuket village and Tsuza river flowing on the South in a South-East to South West direction forming the boundary with Ungma and Kubza village. These rivers are joined by many tributaries that serve as demarcation between the different pouk. For instance Ajen pouk lies between Zemlong yong (a small stream) and Tongtera yong both of which are tributaries of Tsuza river. On the North West Khensa is bounded by Chungtia village and on the South East by Mokokchung Town. During the rotation of the pouk a systematic sequence is followed. In Yimlang even with the establishment of Mekuli village the cycle is completed in 11 years in 9 pouk. The

additional two years is a result of further division of Bensong pouk into two i.e. Bensong and Sali pouk and Ajen pouk into Ajen and Longma pouk. (Table 3.7). Yimpang has also 9 pouk but with the establishment of Yimyu ward on the Southern part of the village bordering Mokokchung Town, two pouk i.e. Ajen pouk and Kupyong pouk have been partially affected by establishment of Yimyu ward, while Archemok pouk is almost completely occupied (Table 3.8). This has reduced the rotation of the pouk to 8 years in one jhum cycle. The number of fields in Ajen and Kupyong pouk have also decreased thereby exerting more pressure on the existing jhum land. Yimyu ward under the jurisdiction of the Mokokchung municipal council became the 16th ward in 2002 but the earliest instance of settlement can be traced back to 1959 when 13 families from Khensa village initially settled in the area forming a settlement on the periphery of the village territory. Thereafter the settlement expanded further developing on the western fringes of Mokokchung town in a linear pattern along the highway. The growth of Yimyu in recent years is attributed to the pull factors of Mokokchung urban center. Today the ward has a population of 2075 persons (2011) in an area of 1.62 sq. km. Currently several establishments both government and private such as educational centres and government offices have sprung up in the ward due to availability of space. The ward is developed in the Archemok pouk, partially in Ajen and Kupyong pouk under Khensa village. This affect the jhum cycle as 20 potential lumang or fields currently constitute the built up areas. A factor for the apparent merging of Yimyu settlement with the municipal was due to migration from Khensa village toward the fringes of the town. In the initial phases, the settlers were predominantly landowners who were employed in the numerous establishments at Yimyu and the district Headquarter.

Lately there is also a growing trend of out-migration from the congested nuclei areas of Mokokchung town towards Yimyu.

Table 3.9: List of establishments in Yimyu ward

Sl. No	Establishment	Type of ownership	Remarks
1.	N.I. Jamir High School	State Government	Upgraded to Higher Secondary School
2.	BDO, R.D. Block Ongpangkong South	State Government	
3.	EAC Office Ongpangkong	State Government	
4.	Government Middle School Yimyu	State Government	Upgraded from Lower Primary School
5.	District Institute of Education and Training	State Government	Erstwhile Junior Teacher Training Institute (JTTI)
6.	Mokokchung College of Teacher Education	State Government	
7.	District Jail Mokokchung	State Government	
8.	Vety & A.H Diseases Diagnostic Laboratory	State Government	
9.	Vety & A.H Hospital	State Government	
10.	Vety & A.H Regional Artificial Insemination Centre	State Government	
11.	CDPO Ongpangkong South	State Government	
12.	Legal Meteorology & Weight & Measures	State Government	

13.	Branch Post Office	Central Government	
14.	J.N.V School	Central Government	
15.	John Douglas School	Private	

Source: Yimyu ward Council (Yimden), Mokokchung. Golden Jubilee Souvenir.

Dairy farming is a predominant economic activity in Yimyu in lieu of jhumming. Other allied activities include vegetable gardening, horticulture, floriculture, fodder cultivation, poultry, piggery etc. The first dairy farm was established as early as 1916 which catered to the demands of milk in the civil hospital located at Mokokchung town. As the demand for milk increased particularly from the urban areas, the number of dairy farms gradually increased and currently 15 such farms exist in Yimyu ward. Gardening of organic vegetables is carried out in these dairy farms owing to the availability of manure. Piggery and poultry are also carried out on small scale by individual families, while fodder crops like tapioca, corn etc., are cultivated to cater the growing demand for feeds substantiating their income. Others are employed in the various service sectors.

While the rotation of the jhum cycles were expected to reduce due to encroachment of traditional jhum areas consequent to the development of Yimyu ward, the duration of the cycle in reality are increasing which is compensated by the increase in the other pouk especially in Yimlang (Lower khel). Over the years it has been observed that the numbers of jhum cultivators are on a decline due to the movement of the people from Khensa to Yimyu. The decline is also attributed to shortage of hand in the jhum fields owing to an increasing enrolment of rural

children in various educational institutions. Cultivators on the other hand are unable to afford additional labour due to steep hike in the labour charges. Hiring of agricultural labour was uncommon in the past as villagers helped each other in the fields. Pull factors such as employment opportunities in the town and various establishments in Yimyu ward aided by improved transport services are largely responsible for out-migration of Khensa population to Yimyu ward. Development of dairy, kitchen gardens, poultry and piggery in the fringes have replaced jhum cultivation thereby providing alternative means of livelihood. Traditionally, forest areas were reserved in certain pockets but with the expansion of urban centre of Mokokchung and increase in population in the village, it is gradually declining due to the increasing demand for firewood. However the village council, realizing the growing importance of conservation and proper management of forest, has set aside two pouk since 2012 with the intension to expand further.

The impact of urbanization in the case of Khensa village has its positive aspect notwithstanding the general impact of urban growth on the environment. The decrease in the number of cultivator in the village due to various factors as observed in the study area has lengthen the duration of the jhum cycle. In recent years some of the pouk which was cultivated in one year is now cultivated in two years as in the case of Jenjang pouk (Table 3.7, Sl.No. 6) which was divided into Jenjang Tevila pouk and Jenjang Tezala pouk in 2007 which will increase the Yimlang jhum cycle from 11 to 12 years from the next cycle.

Study conducted by Brenda (2014) have also observed the impact on the jhum cycle due to occupational change at Merangkong village and Sungratsu village

where it was stated that at Merankong village in the Langpangkong range, approximately 30 per cent of the jhum land has been converted into tea and bamboo plantation. At Sungratsu village in the Asetkong range an entire traditional jhum site has been occupied for farming activities at Yimchalu and the change of occupation from shifting cultivation to intensive cash crop farming have reduced the families engaged in jhum from around 150 to 50 families at present (Brenda, 2014).

3.3.1 Rice

Rice is the staple food for the people of the district. They have a long tradition and are highly knowledgeable about its cultivation through experience. The indigenous rice varieties possess some characteristic features which have mostly poor to medium yields but resistant to diseases and pest, it is also tolerant to cold and stress environment. There are three classes of local cultivar viz- Glutinous rice, Brown rice and Aromatic or scented rice that exists in the State and Mokokchung district has as many as 70 varieties of rice used and cultivated by the farmers. (Rice resources Book of Nagaland, 2007). Table 3.10 shows the different land race of rice used by the local farmers in Mokokchung district.

Table 3.10: Land race of rice used in Mokokchung District

Land race (Local name)	Village	Types of cultivation
Tsunakia, Tsuksemle (white), Mapok Tsuk (Glutinous), Koyamapok (Glutinous), Lanuchunket Tsuk	Dibuia	Jhum
Nailatsuk,	Lakhuni	Jhum
Mongti Tsuk	Salulamang	Jhum
Chaksa, Betsen, Houlang	Yaongyimti	Jhum
Akoia Tsuk	NA	Jhum
Tsuk Merenla, Sungo tsuk (Tea rice)	Mopungchuket	Jhum
Kebza mersong, Tsukchi Tsuk, Tsuiner Mapok	Ungma	Jhum
Longkhum Tsuk	Mekuli	Jhum
Sule Tsuk	NA	Jhum
Tangmo Tsuk	Chuchuyimpang	Jhum
Phillippines, Yimsen malang (Glutinous), Tongsangmalang (Glutinous)	Changki	Jhum
Narila	Changki	NA
Lisem Tsuk	Yachang B	Jhum
Milongmapok Tsuk (Glutinous)	Moayimti	Jhum
Melao Tsuk, Temesungla	Mongsenyimti	Jhum
Khoyo	Longkhum	Jhum
OngpangMalang, Kire Tsuk, Ongpang Tsuk, Yarba Tsuk	Longmisa	Jhum
Khayut Tsuk	NA	Jhum
Metsudangla, Manen (Red)	Aliba	Jhum
Jakmeren (Brown), Suli, Mapok (Temeseng) Glutinous, Mapok (Temerem) Glutinous, Tangma tsuk, Menentsula, Kerhu, Tsungmeki, Moyasuli	Mangmetong	Jhum

Sungmang tsuk	Yisemyong	Jhum
Waromong malang (Glutinous)	Changki	TRC
Mesurong	Mongchen	Jhum
Nangja	Molongyimsen	Jhum
Pangnakla (Black)	Yaongyimsen	Jhum
Tsumar mapok (Glutinous),	Loyong	Jhum
Sungomapok (Tea rice), Aorongmapok (Glutinous)	Chuchuyimlang	Jhum
Shiret mapok (Glutinous), Tsudisang tsuk	Merangkong	Jhum
Longpatsuk, Masuri	Loyong	TRC
Tsuma Tsuk, Apuarua Tsuk, Imsutsuk (Tea rice)	Changtongya	Jhum
Maihatsuk	Kangtsung	Jhum
Lai, Laikoshi, Vikiye	NA	TRC
Nona/ Mysore, Temsumongla	NA	WRC
Grouping, A/Y tsuk, Chitemsangla, Revival tsuk	NA	Jhum
Changki tsuk	NA	Jhum/ WRC

Source: Rice Resource Book of Nagaland, 2007

The area, production and productivity of some important Cereals and Oil seeds in Mokokchung district for the period 2012 to 2014 is given in Table 3.11 and Table 3.12.

Table 3.11: Area, Production and Productivity of Cereals

Sl. No	Name of the crop	2012			2013			2014		
		Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)
1	Jhum paddy	9770	17630	1.80	9690	18520	1.91	9660	18610	1.93
2	TRC/WR C paddy	4980	12200	2.45	5090	12880	2.53	5490	14270	2.60
3	Maize	3900	7620	1.95	3920	7660	1.95	3930	7740	1.97
4	Small Millet	610	530	0.87	610	680	1.11	630	710	1.13
5	Jobs tears	80	80	1.00	90	90	1.00	100	100	1.00

Source: Statistical Hand Book of Nagaland, 2014

Table 3.12: Area, Production and Productivity of Oil seeds

Sl. No	Name of the crop	2012			2013			2014		
		Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)
1	Soya bean	1090	1310	1.20	1100	1330	1.21	1100	1330	1.21
2	Perilla	200	110	0.55	210	130	0.62	210	130	0.62
3	Sesamum	450	260	0.58	450	260	0.58	450	260	0.58
4	Mustard	3080	3100	1.01	3080	3120	1.01	3080	3120	1.01
5	Castor	50	40	0.80	60	50	0.83	60	50	0.83

Source: Statistical Hand Book of Nagaland, 2014

3.3.2 Horticultural crops

The climatic condition of Mokokchung district is mostly sub-tropical and the relief is represented by lowland to hilly terrain. A combination of all these geographical and agro- climatic condition favours the growth of numerous horticultural crops.

3.3.2.1 Fruit crops

It can be observed that in the courtyard of almost every household especially in the villages some fruit tree will be found bearing fruit plentifully. Some of the fruits like papaya, jackfruit, banana, pomelo, guava, peach, mango etc., are very common. The abundant growth of all such varieties of horticultural crops provides ample opportunity for its development. Apart from those fruits, orange, litchi, pineapple, passion fruit also grows well. The district has an estimated area of 4485 ha under horticultural crops. Table 3.13 represents the area, production and yield of some fruits grown in the district.

**Table 3.13: Area, Production and Productivity of fruits in Mokokchung district
during 2012 - 2014**

Sl. No	Name of the crop	2012			2013			2014		
		Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)
1	Orange	900	10100	11.22	950	8500	8.95	1034	8990	8.69
2	Banana	1025	7050	6.88	1025	12500	12.20	1066	15200	14.26
3	Pineapple	1050	8020	7.64	1050	9850	9.38	1102	15144	13.74
4	Litchi	50	80	1.60	30	300	10.00	45	321	7.13
5	Papaya	120	830	6.92	170	1050	6.18	189	2016	10.67
6	Mango	35	70	2.00	55	385	7.00	64	446	6.97
7	Guava	35	170	4.86	45	225	5.00	54	448	8.30
8	Pears	25	55	2.20	30	240	8.00	31	320	10.32
9	Passion fruit	1000	2100	2.10	1020	2346	2.30	1100	2700	2.45
10	Peach	25	55	2.20	35	180	5.14	38	295	7.76
11	Lemon	250	2000	8.00	300	2000	6.67	308	2392	7.77
12	Pomelo	120	570	4.75	100	400	4.00	104	686	6.60
13	Plum	35	65	1.86	45	450	10.00	64	410	6.41
14	Jack fruit	25	90	3.60	25	90	3.60	27	221	8.19
15	Goose berry	25	300	12.00	30	240	8.00	28	304	10.86

Source: Statistical Hand Book of Nagaland, 2014

3.3.2.2 Vegetable crops

Along with paddy, the jhum fields are cultivated with various other crops which have been used for the sustenance of the family but in recent times due to the demand in the market, the farmers have started cultivating vegetable crops in their field for commercial purpose. The items given in the Table 3.14 represents some important crops that are grown commonly by most of the farmers in the district.

Table 3.14: Some important crops grown in Mokokchung District

Sl. No.	Local Name (Mongsen)	Common Name	Scientific Name
1	Alo Lasüng	Japanese scallion	<i>Allium Chinense</i> G.Don.
2	Reptsa	Hooker chives	<i>Allium hookeri</i> Thwaites
3	Matsu	Cucumber	<i>Cucumis sativus</i>
4	Mertsu	Chilli	<i>Capsicum annum</i> L
5	Raja mertsu	Naga King chilli	<i>Capsicum chinense</i> Jacq.
6	Aro	Wild spinach	<i>Chenopodium album</i> L.
7	Ami	Cocoyam/Taro/Elephant ear	<i>Colocasia esculenta</i> (L) Schott
8	Süngtong bengana	Tree tomato/Tamarillo	<i>Cyphomandra betacea</i> (Cav.) Sendt.
9	Acha	Air potato/Bitter Yam	<i>Dioscorea bulbifera</i> L
10	Napakbi	Hyacinth bean	<i>Dolichos Lablab</i> L.
11	Chamulo	Soya Bean	<i>Glycine max</i> (L) Merr
12	Ensürep	Red sorrel	<i>Hibiscus sabdariffa</i> L
13	Chamiyang	Sweet Potato	<i>Ipomea batata</i> (L) Lam.
14	Pokah	Sponge gourd	<i>Luffa cylindrical</i> (L) Roem

15	Bengana	Cherry tomato	<i>Lycopersicon</i> <i>Lycopersicum</i>
16	Alicha	Tapioca	<i>Manihot esculanta</i> <i>Variegata</i>
17	Alicha	Tapioca/cassava	<i>Manihot esculanta</i> <i>crantz.</i>
18	Putina	Garden mint/spear mint	<i>Mentha spicata</i> L
19	Kara	Bitter gourd	<i>Momordica charantia</i>
20	Tsuma kara	Spiny gourd	<i>Momordica foetida</i> <i>schumach</i>
21	Müchen	Cowhage	<i>Mucuna pruriens</i> (L) D.C.
22	Avong	Perila	<i>Perrilla frutescens</i> (L) Britton
23	Aochisang	-	-
24	Dakra	Winged bean	<i>Psophocarpus</i> <i>tetragonolobus</i> (L) D.C.
25	Bünto	Brinjal/eggplant	<i>Solanum melongena</i> L.
26	Menti	Maize/glutinous corn	<i>Zea mays</i>
27	Sungmok (C,M)*	Naga ginger	<i>Zingiber officinalis</i> <i>Roscoe</i>
28	Vongtsung	Sesame	<i>Sesamum indicum</i>
29	Longkok	African egg plant/Indian nightshade	<i>Solanum indicum</i> L
30	Napa (C,M)	-	<i>Elsholtzia</i> sp
31	Nangpera (C,M)	Basil	<i>Ocimum Basilicum</i> Linn
32	Chami	Rice bean	<i>Vigna umbellate</i>
33	Longkok	-	<i>Solanum</i> sp
34	Motor	Pea	<i>Pisum sativum</i>
35	Lolly	Yardlong bean	<i>Vigna unguiculata</i>
36	Seem	French Bean	<i>Phaseolus vulgaris</i>

37	Mafo	Pumpkin	<i>Cucurbita moschata</i>
38	Lao	Bottle gourd	<i>Lagenaria siceraria</i>
39	Mafo Temesungla	Ash gourd	<i>Benincasa hispida</i>
40	Local dunia	Long coriander/Fit weed	<i>Eryngium foetidum</i> L.
41	Tatawa	Amaranth	<i>Amaranthas</i> sp.
42	Kholar	Kidney bean	<i>Phaseolus vulgaris</i>
43	Chenchang	Millet	<i>Eleusine coracana</i>
44	Amenchang	Jobs tears	<i>Coix lacryma- jobi</i> L.
45	Mafo Matsu	Honeydew muskmelon	<i>Cucumis melo</i>
46	Squash	Alligator bear/ chow chow/ chayote	<i>Sechium edule</i> (Jacq) Swartz.

*(C,M- Chungli and Mongsen)

Source:Field survey, 2010- 2014

The jhum fields are cultivated during summer season and it is left fallow during the dry season. Therefore almost all the crops are grown only during the summer and for the dry season the farmers have mastered to preserve certain crops like maize, chilli, colocasia, soyabean etc. Among all these crops colocasia occupies an important position as the whole parts including its tuber, stem, leaves of the plant are used for consumption and it can be preserved for a long duration after careful processing. The tuber after it is harvested can be used as food stuff, the stem and leaves are cut into small pieces and dried in the sun which can be kept for a long period. The leaves are crushed, baked and dried to make Anishi which is a delicacy and an important item used in preparing curry by the Ao (Naga) tribe. The seeds of other crops are also harvested and kept for consumption as well as preserved for the next cultivation.

The productivity of some important Pulses and commercial crops in the district for the period 2012 to 2014 is given in Table 3.15 and Table 3.16.

Table 3.15: Area, Production and Productivity of Pulses

Sl. No	Name of the crop	2012			2013			2014		
		Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)
1	Naga Dal (Rice bean)	340	330	0.97	340	370	1.09	340	370	1.09
2	Beans	220	270	1.23	220	290	1.32	230	310	1.35
3	Rajma kholar	990	1210	1.22	1030	1270	1.23	1050	1280	1.22
4	Pea	770	700	0.91	640	670	1.05	640	690	1.08
5	Lentils	210	170	0.81	230	190	0.83	230	190	0.83

Source: Statistical Hand Book of Nagaland, 2014

Table 3.16: Area, Production and Productivity of Commercial crops and others

Sl. No	Name of the crop	2012			2013			2014		
		Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)	Area (Ha)	Production (MT)	Productivity MT/ (Ha)
1	Sugarcane	330	14230	43.12	330	14230	43.12	330	14230	43.12
2	Potato	710	6410	9.03	730	7300	10.00	730	7300	10.00
3	Tea	750	3340	4.45	750	3340	4.45	750	3340	4.45

4	Tapioca	580	13700	23.62	610	12390	20.31	610	12390	20.31
5	Colocasia	440	4190	9.52	440	4190	9.52	440	4190	9.52
6	Yam	140	1020	7.29	160	1160	7.25	160	1160	7.25
7	Ginger	-	-	-	250	2280	9.12	-	-	-

Source: Statistical Hand Book of Nagaland, 2014

3.3.2.3 Plantation crops

Table 3.17 represents the plantation crops cultivated by people of the district that are used for consumption and having commercial value.

Table 3.17: Plantation crops grown in Mokokchung District

Sl. No.	Local Name (Mongsen)	Common Name	Scientific Name
1	Patiwa	Betel leaf vine	<i>Piper betle</i> Linn.
2	Koijang	Betel nut	<i>Areca catechu</i> L.
3	Yongchak	Tree bean	<i>Parkia roxburghii</i> G. Don.
4	Motsu	Sugar cane	<i>Saccharum officinarum</i> L.
5	Sunga	Tea	<i>Camellia sinensis</i> (Linn) Kuntze.
6	Elachi	Cardamom	<i>Elettaria cardamomum</i> Mat.
7	Haldi	Turmeric	<i>Curcuma longa</i> L.

Source: Field survey, 2010- 2014

3.3.2.4 Floriculture crops

The climatic condition of Mokokchung district is suitable for the growth of a number of floricultural crops. The people have a special love for flowers and it can be seen by the different type of flowers surrounding most of the households. The Northeast, including Nagaland is blessed with tropical to alpine humid forest with heavy rainfall and high humidity which provide suitable habitat for a number of orchid species. There are over a thousand species of orchids in India. Out of this more than fifty per cent, i.e., about 650 orchid species grow in Northeast India. Nagaland can boast for over 360 orchid species (Changkija et al, 1992).

In recent years, cultivation and development of flowers have started on a commercial scale. Area, production and productivity of some cut flowers grown commercially in Mokokchung district is depicted in Table 3.18.

Table 3.18: Area and Production of flowers during 2013-14

Sl.No	Name of the flower	Area (m ²)	Production (number of stems)	Productivity (stems/m ²)
1	Rose	3000	300000	100
2	Lilium	2400	144000	60
3	Alstromeria	1400	98000	70

Source: Statistical Hand Book of Nagaland, 2014

3.4 Animal Husbandry

The rearing of livestock and poultry at the homestead are a common feature in the district of Mokokchung. The rural people use to rear the animals like pig, chicken for meat specially pork which is preferred by most of the people. In every occasion pork occupies the main dish followed by other items. Earlier in the past days they use to rear pigs in the open which was of local variety but at present the pigs of exotic blood of large and medium variety are reared in confined houses made of locally available materials and feeding is done by the owner. Poultry of local breed are also reared by many people at their homes. There are few entrepreneurs who rear broiler and Kroulier at a small scale especially in the urban areas. Cattle rearing are also done for its milk. In the past the system of rearing was open grazing but at present almost all the villages have banned this system as the animal used to destroy the standing crop. At present the demand of all these animals at the market is made with the import from outside the State as the produce of the local people is mostly for their own consumption only. In the main market place and also within the Town area there are altogether 24 pork stalls where in an average 3-4 pigs are slaughtered at every stall and sold every day excluding Sunday. All those pigs are brought from outside. Local pork is also sold at three locations but they are not regular. There are 11 Poultry shops which also depend on the supply from Assam. Out of these shops only one sells poultry that are reared at their own farm. Apart from the pork and poultry stalls, there are five beef shops and three buffalo meat shops. One Mutton shop is also found but it is not regular. Dairy products mainly

comes from Yimyu ward and DEF areas. Table 3.19 represents the productivity of livestock in Mokokchung.

Table 3.19: Productivity of Livestock in Mokokchung district

Species	Milk yield (Kg/day/animal)	Avg. Meat yield (kg/animal/year)
Cattle	4.51	120
Cross breed		
Indigenous	1.15	
Buffalo	1.153	170
Goat/ Sheep	0.333	22
Pig	-	70

Source: Integrated Sample Survey, 2007-08, Directorate of Vety & AH, Nagaland

3.5 Concluding Statement

The richness of biotic resources of the district especially of plants has been exhibited by the occurrence of a variety of wild fruits and vegetables. The favourable climatic condition to a large extend made this region a store house of biodiversity. Elaborated efforts were put in to identify and assess the available forest resources and cultivated crops that are utilised by the people of the district. Attempts have been made to use the common names as much as possible but due to limitation in the literature many of the plants and agricultural crops are given in local name. Even the local names consist of three distinct character i.e., Chungli, Mongsen and Changki, therefore in this study Mongsen names are used. It was observed that many of the plants have multi utility for the people. Bamboo is one such resource which is used

as an important building material in the rural areas while it is used as a food stuff in the form of bamboo shoots. It can be cooked and eaten fresh or the shoots are crushed and the liquid is separated. The crushed bamboo shoots and the liquid is kept separately which is preserved and used for the whole year. The crushed bamboo shoots are also dried in the sun that can be preserved for a longer period of time. And with the improvement and demand for specialist food item bamboo shoot pickles are a new addition to the uses of bamboo. A significant distributional pattern of different plants and crops on the basis of altitude have also been observed. Though many of them grow in common, the higher altitude i.e. Ongpangkong range have vegetable crops like squash in almost every courtyard of the homes. While on the lower altitude toward Japukong, Tsurangkong and lower portion of Langpangkong betel nut and betel leaf vine are common. A variety of vegetable items are grown in the field but lacks in the cultivation of potato, tomato, onion, cabbage and even chilli which are some basic vegetable items that are consumed by the people especially in the urban areas. There is a vast scope for the development of horticulture in the district. At present the important fruit that are grown successfully are orange, banana, pineapple, litchi etc. The uses of medicinal plants have been tremendous as many of the herbs and plant have been used by the locals to treat various ailments for centuries. The people of the district have a high demand of meat and poultry product but at present there is total dependency on the import of those items from outside the State.

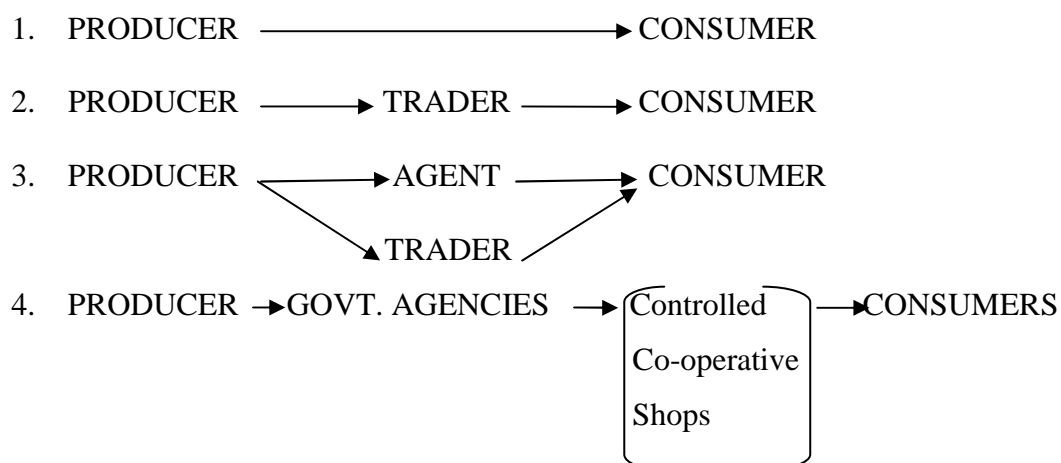
Chapter-4

**Analysis of Marketing Structure
of Agricultural Products**

4.1 Introduction

Marketing is a process or phenomenon of interaction among producers, distributors, buyers and users or in other words it includes all processes and service a commodity goes through as it travels from producer to the consumer (Saxena, 2004). The producer in agricultural marketing is the farmer and he also distributes and supplies the items to the market. An efficient marketing structure is required for the consistent flow of the produce as the farmers are ignorant about the marketing system. The process of agricultural marketing leads to the movement of goods and services during which different commodities moves from one channel to another. Distribution of the produce in an unregulated marketing system follow a system where the items reach the customer either directly from the farmer or through a middle man, trader or government agencies, while in regulated markets the operation of trading is done under various rules and regulations in which market functionaries are controlled by legislative measures. In the whole process of transferring the commodity exchange function of buying and selling is followed by physical function like storage, transportation and processing while facilitating functions involves standardisation, financing, risk bearing and market intelligence. A diagrammatic representation of the process of agricultural marketing by Saxena, (2004) gives a detailed explanation which is depicted in Fig 4.1 and Fig 4.2.

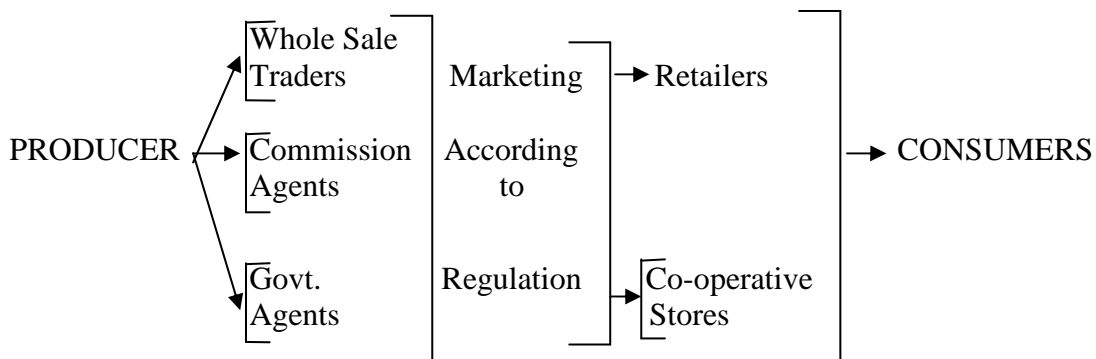
(A) IN NON-REGULATED MARKETS



Source: H.M. Saxena, 2004

Fig. 4.1: Process of agricultural Marketing in non regulated markets

(B) IN REGULATED MARKETS



Source: H.M. Saxena, 2004

Fig. 4.2: Process of agricultural Marketing in regulated markets

The prevailing system in marketing of agricultural produce in the district is still undeveloped and unorganised. It follows the non regulated market system where the produce are sold by the producer to the customers directly; or producer to the traders and to the consumer; or producer to either an agent or trader and to the consumers. The price is decided by those people manning the stalls in the market and there is no standard weight and measures for determining the quantity of the various agricultural items. The existing method of measurement used by the people in the market are plates, cups and bundles of different sizes depending on the one who does the arrangement and also on availability of the different produce.



Plate 4.1: Use of plate for measurement of agricultural items



Plate 4.2: Use of cups for measurement of agricultural items



Plate 4.3: Use of bundles for measurement of agricultural items

This process of market has evolved due to the absence of a proper marketing system in the district. Agriculture is still primitive as the people practice the age old method of shifting cultivation on the hilly tracts which can barely satisfy the needs of their families as demand of higher living standard have increased, while on the valley areas terrace wet rice cultivation is practice where most of the farmers lease their field to non local farmers and therefore the return is at the minimal. Fields both in the hill and upland areas remain fallow during the dry season due to shortage of water as it is dependent on the monsoon rain. The items that are found in the market also show dependence of farmers on the seasons as the items sold in summer which include mostly fresh green leafy vegetables of different variety and fruits are replaces in winter by dried items and very few crops, fruits and vegetable that grow and survive the dry season dominate the market scene.

4.2 Types of agricultural market in Mokokchung District

In past centuries the people of the district have started exchange of goods through barter system with people in the plains of Assam. After the introduction of modern means of transport, communication and its development; marketing of agricultural produce have started picking up especially in the lower region of the district where the people have cultivated cash crops like betel nut, betel vine, orange etc. The demands for vegetables in the urban areas have also encouraged the farmers from villages like Khensa, Mokokchung village, Ungma and Chuchuyimpang located near the district headquarter to raise vegetable crops. In the absence of a well organised marketing system the farmers sell their produce mostly on their own. They

carry the items on bamboo baskets to the market place and some of the old ladies even sell vegetables visiting house to house in the urban areas which can be said to be a crude form of the present day home delivery system that was being practiced by those people in the past. Some of the agricultural produce like squash, ginger, turmeric; fruits like pears, orange and other items like betel nut, betel vine etc., are bought by the traders from Assam who usually comes collecting to the farms or home where it is grown. The types of agricultural marketing that exist at present are Daily markets, Roadside markets and Weekly markets.

4.2.1 Daily markets

The daily markets are established in and around the main town of the district headquarter and divisional headquarters of Mangkolemba, Changtongya and Tuli. There are both local and non local vegetable shops. In the main town vegetable market is spread in three locations i.e., one at Salangtem market, one at the old Town Hall complex and one at Kichuchar complex. There are altogether 23 licensed local traders who sell local agricultural products which include a variety of green leafy vegetable both wild and cultivated, squash, plantain inflorescence, pumpkin, brinjal, chilli, colocasia, sweet potato etc., fruits like banana, guava, orange, papaya, litchi etc., and other items like eri silk worm, crabs, fish etc. The local traders get all these items from the farmers of different villages who are unable to come every day to the market to sell their produce. Almost all the villages have community bus therefore the farmers usually send the item through this service. Apart from the licensed local traders there are many vegetable vendors from the nearby village of the urban centre

who do not come regularly but they use to bring the produce and sell in this daily market place. The local vegetable shops located at Salangtem market place have 4 regular stalls and at the Old Town Hall complex there are 14 stalls managed by Mokokchung Municipal Council (MMC). Each stall renews their trade licensed annually which changes every year and pay monthly rent of Rs.280. There are 5 local shops at Kichuchar complex managed by a local society and so they have to pay more tax to MMC as well as the rent are higher which is about Rs. 700 per month.

In the main marketing centre there are 35 non local vegetable shops and at Sewak gate there are around 10 shops dealing with food stuff brought from Assam and other states which include vegetables like potato, tomato, chilli, cabbage, onion, carrot, beans, spinach, garlic etc. The non local vegetable shops are under the control of MMC and pay annual tax whereas all the shops are opened at rented house owned by the local people, so monthly rents of all those shops differs and are at a higher rate.

4.2.2 Road side Markets

The vegetables have short life span and get spoilt within a day or two after it is harvested and due to the small scale cultivation in the district and distance of the villages away from urban centre many of the farmers cannot afford to bring the produce to the market place. The marketable items are therefore brought to some convenient location on the roadside like a junction, bus stop, taxi stand and waiting shed where the commuters can buy it. Road side marketing studies have been conducted by various scholars and in the work of Paul Work and John Carew (1970)

they have stated that- many successful vegetable growers in all sections of the country try to build fine outlets for their products through roadside markets. The items that are available in such location are mostly fresh and much cheaper. The usual local vegetable stall located along the State highways-6 (now NH-702D) connecting Mokokchung with Mariani are at Sabangya, New camp, Changki Junction, Longnak, Satsuk Junction, Chungtia Yimsen and occasionally at various other locations specially during summer season. Along the National Highway (NH-2) that connects with Amguri, the important local vegetable markets are at Impur Junction, Chuchu Town, Changtongya Town, Tuli town and Tzutikong.



Plate 4.4: Roadside markets at Minkong, Impur Junction



Plate 4.5: Temporary roadside marketing stall



Plate 4.6: Roadside marketing shed on the highway



Plate 4.7: Roadside marketing cum waiting shed constructed by Government



Plate 4.8: Roadside marketing shed constructed by Government

4.2.3 Weekly Markets

The system of weekly markets have not developed much in the district though there had been report of this type being carried out in the villages and towns close to the plain where the traders from Assam bring a variety of goods that includes agricultural products, livestock, eatery items, household utilities etc., once a week. For the convenience of the customers they used to trade in a specific location. Majority of the people living in the higher altitude were more or less satisfied with the produce that they obtain from their field and the other requirements available in the market and at the same time the distance for the traders from Assam to take the goods to those locations hindered the development of weekly markets. A weekly (Wednesday) market has been operational and progressive over a decade at Tuli Town. In 2006 with the initiative of the Town council at Changtongya town a weekly bazaar was established that operate every Saturday. The traders come from Amguri with different varieties of goods that include rice, vegetable items like potato, tomato, onion, chilli, cabbage, ladies finger, carrot, radish, turnip, fruits like apple, mango etc., fish, poultry, garments, electronic items, eatery of different varieties, handicraft, metal works like dao, knife etc. One such market had also started at Yajang C village from 2010. These traders who come from Assam also take locally available agricultural item like betel nut, betel vine leaves, orange, ginger from the local farmers and take it to Assam.



Plate 4.9: Weekly market at Changtongya Town



Plate 4.10: Vegetable item at Changtongya weekly market

With the success of these weekly markets and the improvement of road condition, transport facility and demands of more products, there is an increase of weekly markets which have started to develop in the villages of Khensa, Chuchuyimpang, Ungma, Sabangya of Ongpangkong range which is located more

than 85km away from Mariani and at many other locations like Longnak, Changki, Khar, Waromung, Mangkolemba, Chungtiayimsen. The weekly market at Khensa village which started in 2014 with the initiative of a group of likeminded people from Yimyu Ward in collaboration with the village council is progressive. The trader comes from Mariani every Monday morning at around 6:00 A.M, the number of stalls ranges from 20- 25. The goods that they bring include rice, vegetable items like potato, tomato, onion, chilli, cabbage, ladies finger, carrot, radish, turnip, fruits like apple, mango etc., fish, poultry, garments, electronic items, eatery of different varieties, handicraft, metal works like dao, knife etc. Villagers also sell local vegetables and trade agricultural produce like squash, ginger, colocasia etc., with those people from Assam. After doing business for the whole day they return back with those local items to Mariani at around 4:00 P.M.



Plate 4.11: Weekly market at Khensa village



Plate 4.12: Vegetable items at Khensa weekly market

In 2015 Ungma village has also started their own weekly market. The traders come every Saturday with goods that are almost the same which are brought to Khensa village. The number of stalls ranges from 20-25.



Plate 4.13: Weekly market at Ungma village



Plate 4.14: Vegetable items at Ungma village

Again in that year itself around the same time they started a weekly market at Chuchuyimpang village who comes every Thursday with almost the same items and the number of stalls ranges from 20 -25. From all these villages they buy the local item similar to those that are available at Khensa village.



Plate 4.15: Weekly market at Chuchuyimpang village



Plate 4.16: Betel leaf and vegetable item sold at Chuchuyimpang village



Plate 4.17: Squash sold to non local traders

To encourage local farmers and cultivators the Watsu Mungdang (women organisation of the Aos) have started a weekly market at the heart of the town in 2010. The market initially started at the main Police Point in Imlong Place with six Self Help Group (SHG) who used to bring their marketable items every Wednesday and do the marketing from 7:00 A.M to 4:00 P.M. But today with the increase in the number of stall and the need for larger space the market is shifted to the New Shopping Complex which is under the Mokokchung Municipal Council. The farmers bring all sorts of agricultural produce and forest products. They are provided free space at the centre of the complex without any charges and volunteers from the Watsu Mungdang assist them. The volunteers also control the price fixed by the farmers for sale so that the customers whoever comes are also satisfied. The number

of participant fluctuate every marketing day but at an average in a week there are about 130- 140 person at an average involved in the market who comes from villages like Longpa, Chuchuyimlang, Khensa, Mekuli, Aliba, Chungtia, Kinunger, Ungma, Longkhum, Mangmetong, Longsa, Sungratsu, Mopungchuket, Longjang, Chuchuyimpang, D.E.F, Longmisa, Yaongyimti, Longkong, Chakpa, Mongsenyimti, Yisemyong, and many other nearby villages located close to the Town. People from other district especially from the village near Mokokchung district like Aret villagers from Wokha district; Sumi Settsu villagers from Zunheboto district and Alisopur villagers from Tuensang district also bring their produce to this market. It was reported that from Alisopur village there were about 25-28 stalls at an average every Wednesday. The items sold in the market includes green leafy vegetables, cucumber, pumkin, bamboo shoot (freshly cut, dried, crushed and even the liquid obtained after crushing), plantain inflorescences, gooseberry, banana, crabs, eri silkworm, zanthoxylum leaves and dried seeds, chilli, brinjal, ginger, bitter gourd, mushroom (Local and cultured), sticky rice, anishi, squash, walnut, winged bean, sponge gourd, colocasia, Indian pennywort, papaya etc.



Plate 4.18: Watsu Mungdang Wednesday weekly market

4.3 Important agricultural produce from different Circles of Mokokchung district

Some of the important agricultural productions from the villages of different blocks of Mokokchung district are given in Table 4.1 to Table 4.8.

Table 4.1: Agricultural produce from Changtongya Circle in Mokokchung

District

Sl.No.	Name of Circle	Name of Village	Name of products	Total products for sale in kgs
1	Changtongya	Changtongya(o)	1.Banana 2.Orange 3.Pineapple	90,000 kg 120,000 kg 80,0000 kg
2	-do-	Changtongya(N)	1.Banana 2.Orange 3.Pineapple	40,000 kg 20,000 kg 50,000 kg
3	-do-	Yaongyimsen	1.Orange 2.Pineapple	50,000 kg 60,000 kg
4	-do-	Akhoia	1.Banana 2.Bamboo shoot	35,000 kg 10,000 ltr
5	-do-	Kelingmen	1.Bamboo shoot 2.Betelnut	4000 ltr 6000 kgs
6	-do-	Unger	1.Cucumber 2.Orange	15,000 kg 30,000 kg

Source: Directorate of Rural Development, Nagaland, 2012

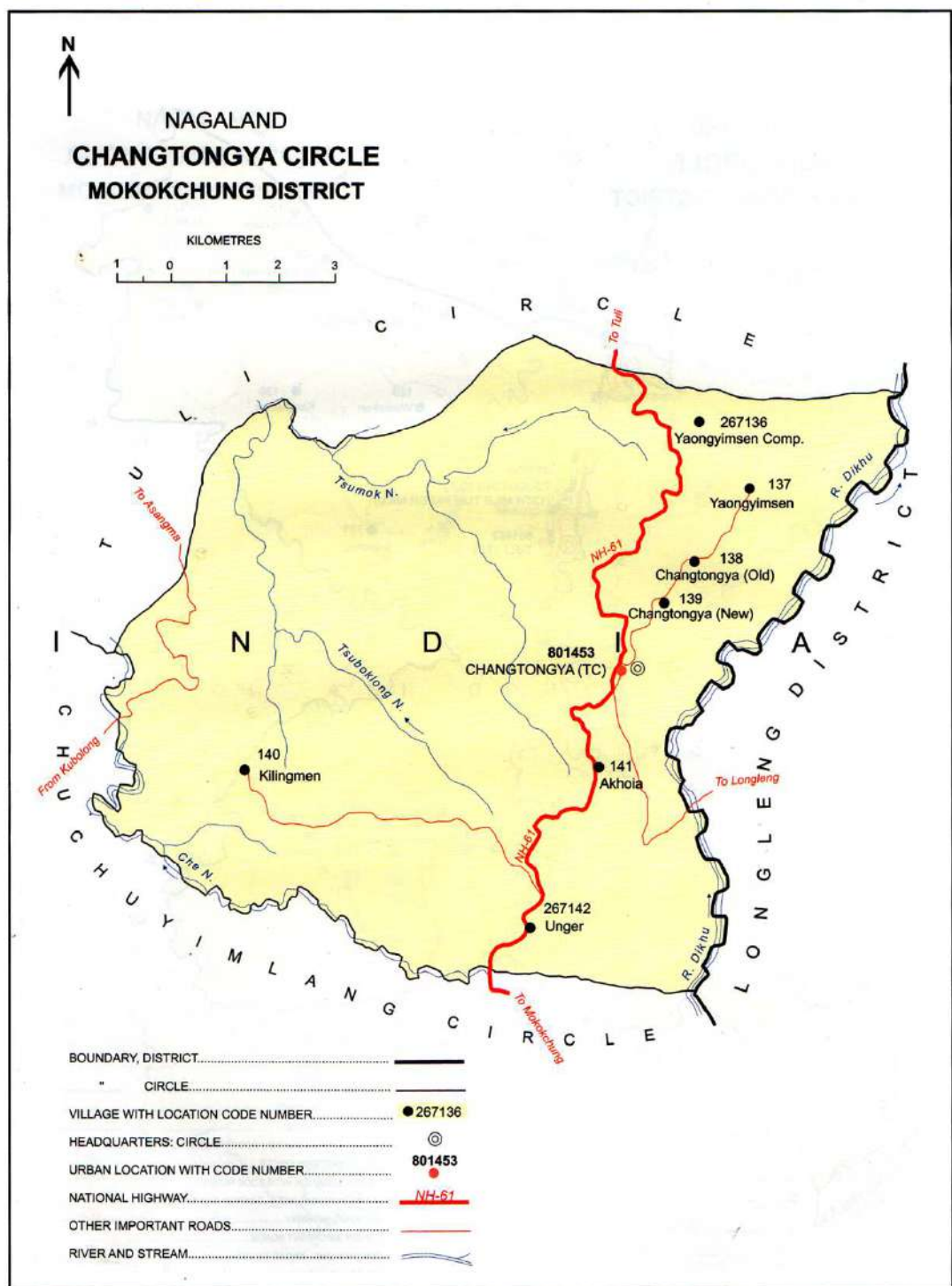


Fig. 4.3: Map of Changtongya Circle

Source: Administrative Atlas, Nagaland, 2012

* NH-61 renamed as NH-2

Table 4.2: Agricultural produce from Tuli Circle in Mokokchung District

Sl.No.	Name of Circle	Name of Village	Name of products	Total products for sale in kgs
1	Tuli	Merangkong	Vegetables	20,000 kg
2	-do-	Wameken	Ginger	30,000 kg
3	-do-	Anaki	Pan leaves	5000 bdle
4	-do-	Kangtsung	Tea	4000 kg
5	-do-	Asangma	1.Ginger 2.Betelnut	3000 kg 4000kg
6	-do-	Anakiyimsen	Black Pepper	200 kg
7	-do-	Anaki(C)	–	–

Source: Directorate of Rural Development, Nagaland, 2012

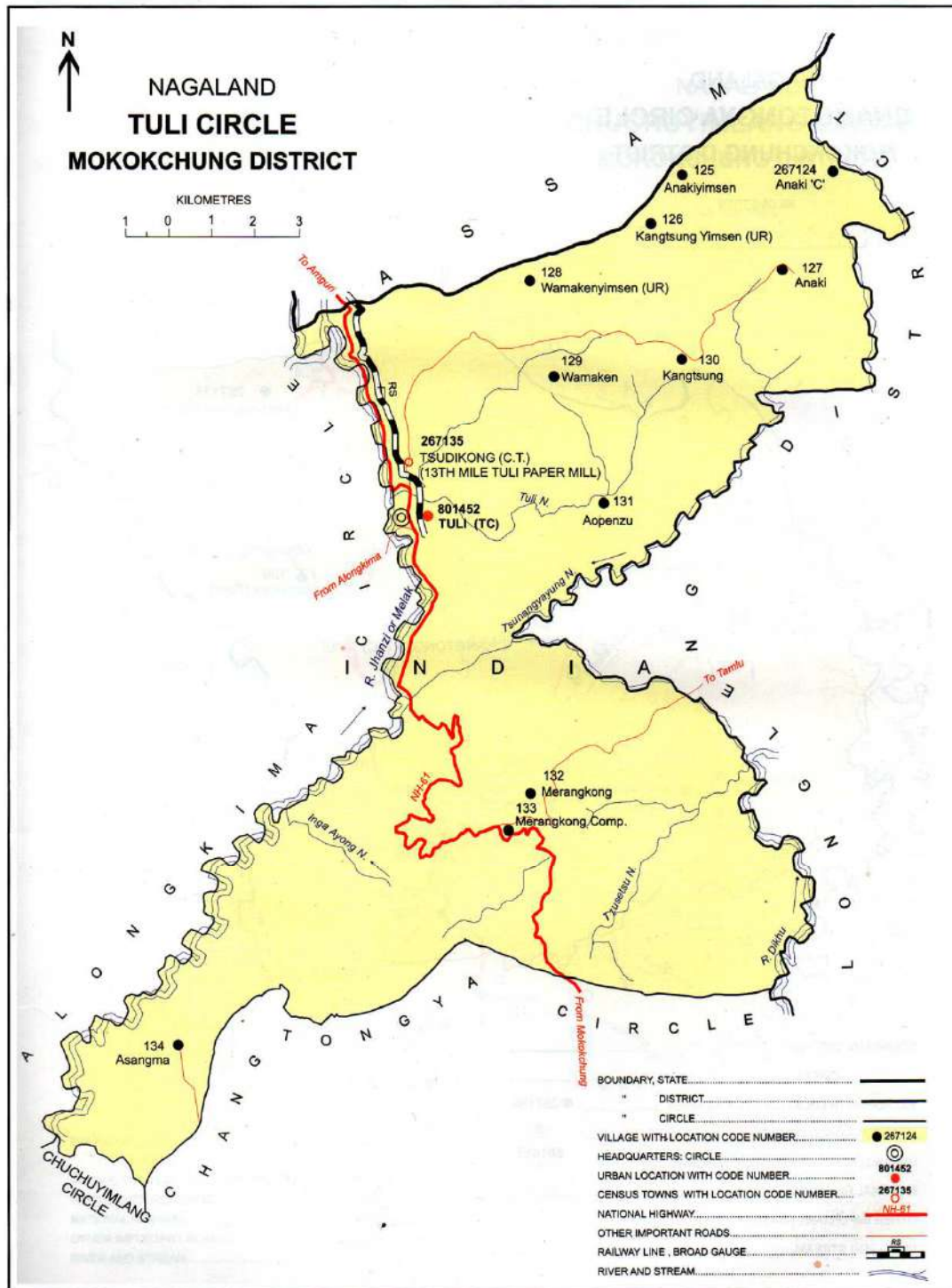


Fig. 4.4: Map of Tuli circle

Source: Administrative Atlas, Nagaland, 2012

Table 4.3: Agricultural produce from Chuchuyimlang Circle in Mokokchung**District**

Sl.No.	Name of Circle	Name of Village	Name of products	Total products for sale in kgs
1	Chuchuyimlang	Chuchuyimlang	1.Banana 2.Orange	80,000 kg 50,000 kg
2	-do-	Mongsenyimti	Banana	40,000 kg
3	-do-	Longkong	1.Banana 2.Passion fruits	25,000 kg 30,000 kg
4	-do-	Chakpa	Maize	30,000 kg
5	-do-	Yaongyimti(O)	Pineapple	1500 kg
6	-do-	Yaongyimti(N)	Pineapple	1000 kg
7	-do-	Salulemang	Orange	20,000 kg

Source: Directorate of Rural Development, Nagaland, 2012

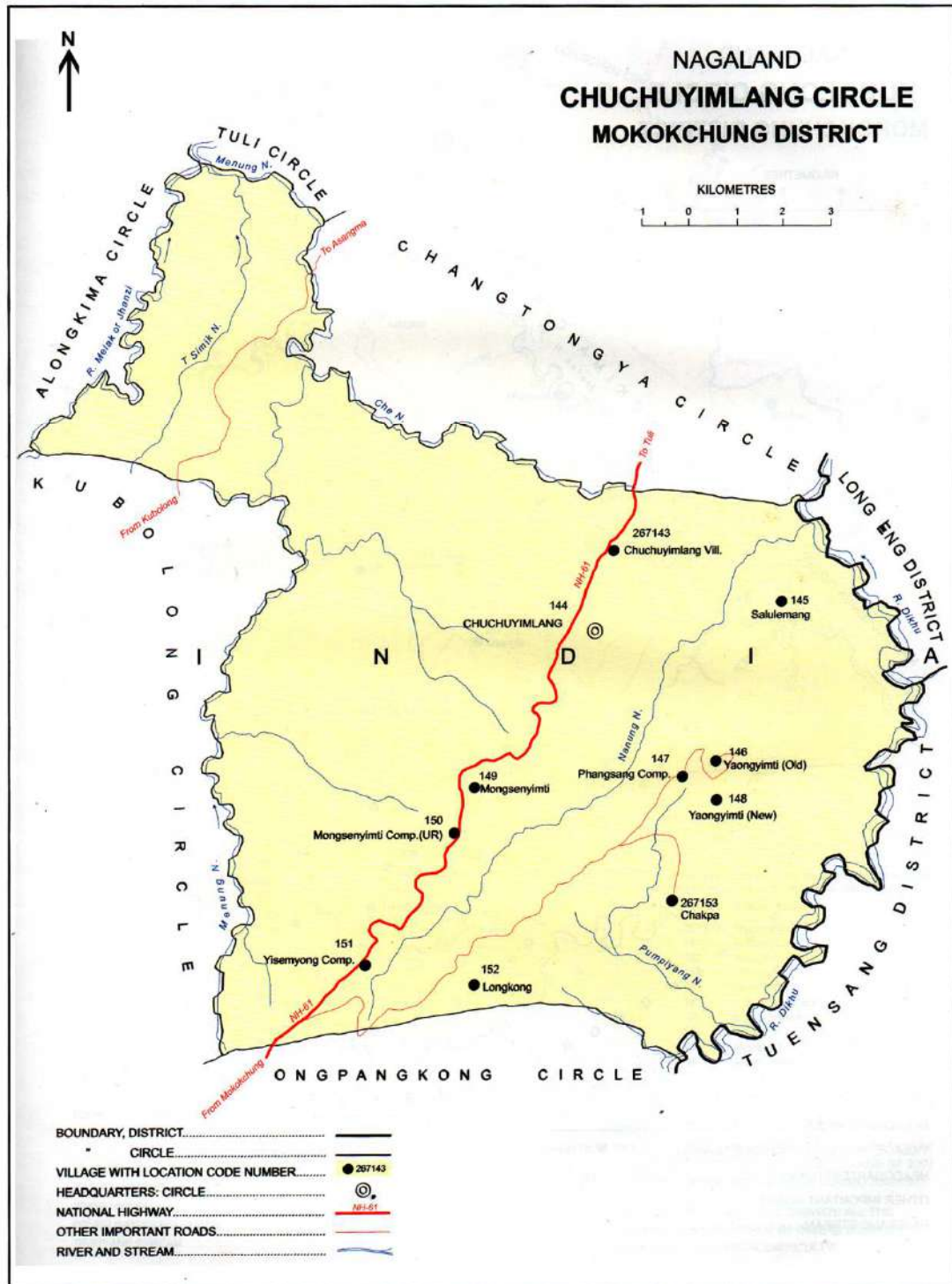


Fig. 4.5: Map of Chuchuyimlang Circle

Source: Administrative Atlas, Nagaland, 2012

Table 4.4: Agricultural produce from Kubolong Circle in Mokokchung District

Sl.No.	Name of Circle	Name of Village	Name of products	Total products for sale in kgs
1	Kubolong	Mopungchuket	1.Squash 2. Passion fruit 3.Cucumber 4.Tapioca	10,000 kgs 5000 kgs 1,200 kgs 23,000 kgs
2	-do-	Sungratsu	1.Passion fruit 2.Tapioca 3.Orange	24,000 kgs 20,000 kgs 10,000 kgs
3	-do-	Chami	Tapioca	30,000 kgs
4	-do-	Longpa	1.Litchi 2.Orange 3.Mitjinga leaves (Mangwa)	2,000 kgs 5,000 kgs 20,000 bdls
5	-do-	Longjang	1.Litchi 2.Orange 3.Mitjinga leaves (Mangwa) 4.Betel nut	4,000 kgs 5000 kgs 40,000 bdls 10,000 kgs

Source: Directorate of Rural Development, Nagaland, 2012

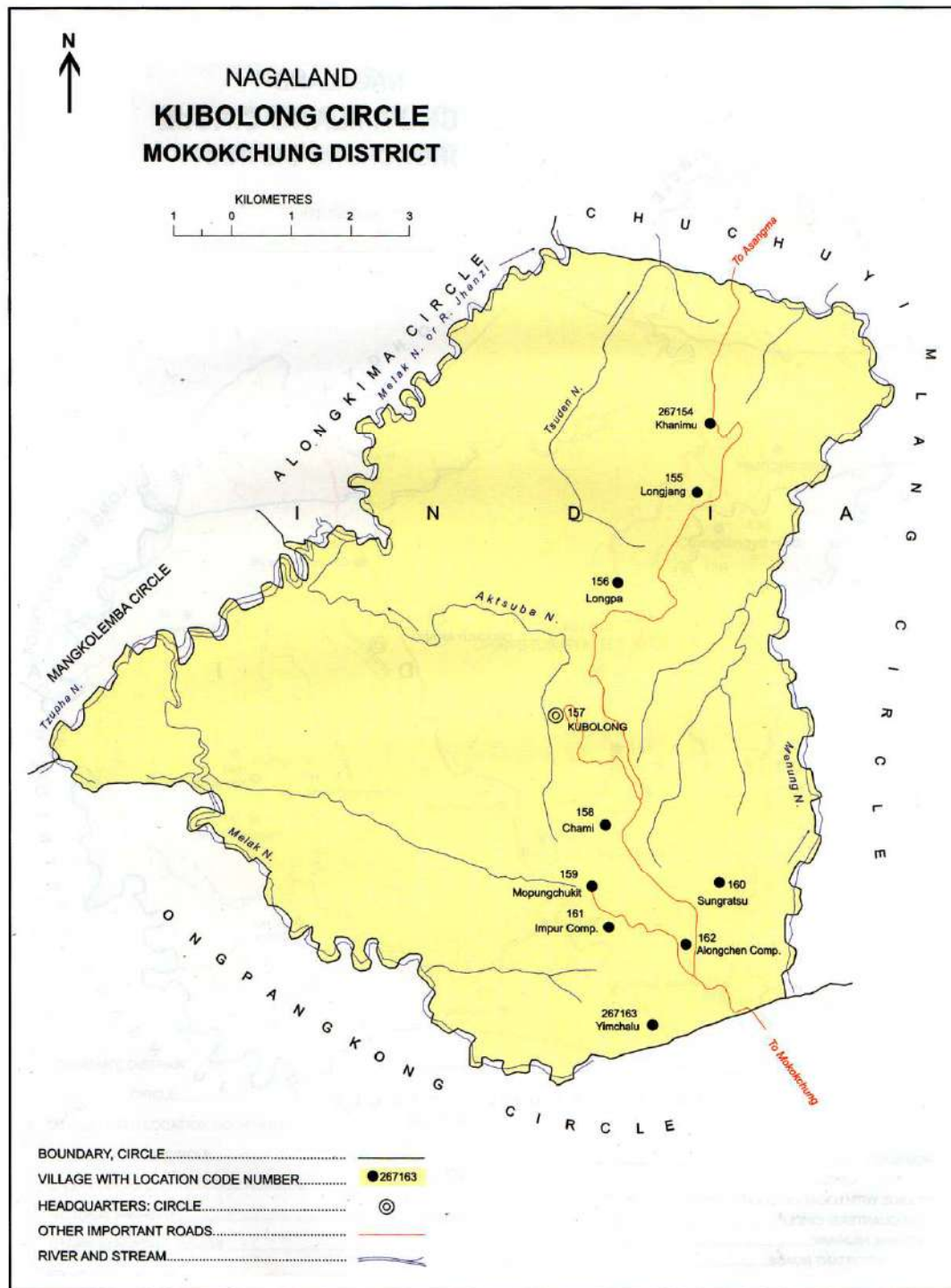


Fig. 4.6: Map of Kubolong Circle

Source: Administrative Atlas, Nagaland, 2012

Table 4.5: Agricultural produce from Mangkolemba Circle in Mokokchung**District**

Sl.No.	Name of Circle	Name of Village	Name of products	Total products for sale in kgs
1	Mangkolemba	Changki	1.Pineapple 2.Ginger	40,000 kgs 20,000 kgs
2	-do-	Chungliyimsen	Ginger	5000 kgs
3	-do-	Khar	1.Ginger 2.Mustard seeds	36,000 kgs 3000 kgs
4	-do-	Chungtiayimsen	Betelnut	8000 kgs
5	-do-	Longpayimsen	Betelnut	8000 kgs

Source: Directorate of Rural Development, Nagaland, 2012

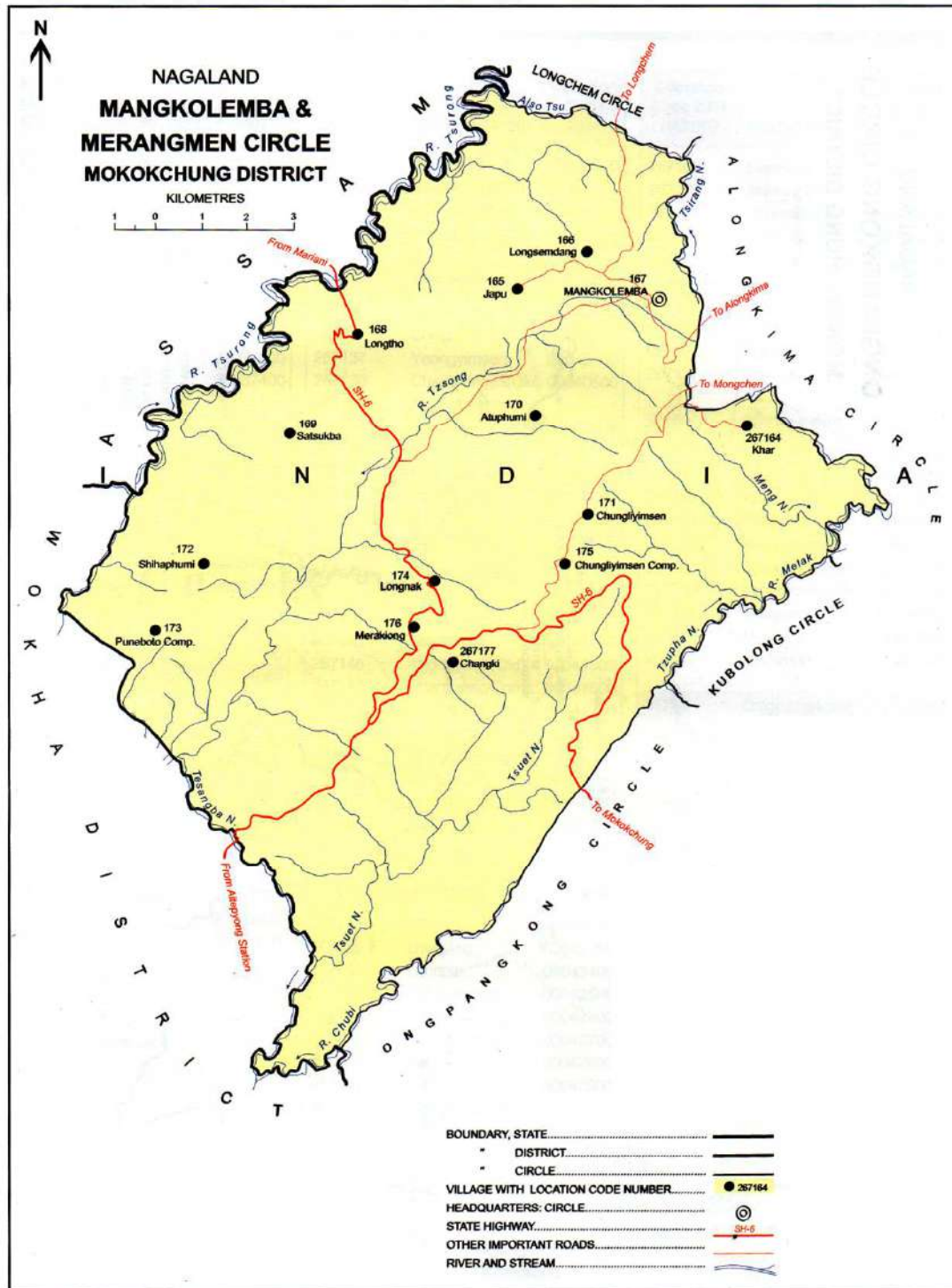


Fig. 4.7: Map of Mangkolemba Circle

Source: Administrative Atlas, Nagaland, 2012

Table 4.6: Agricultural produce from Alongkima Circle in Mokokchung**District**

Sl.No.	Name of Circle	Name of Village	Name of products	Total products for sale in kgs
1	Alongkima	Mongchen	Ginger	5000 kgs
2	-do-	Dibuia	Ginger	5000 kgs
3	-do-	Waromung	1.Ginger 2.Mustard seeds	20,000 kgs 2000 kgs
4	-do-	Yimjenkimong	Ginger	5000 kgs
5	-do-	Molungkimong	Ginger	5000 kgs
6	-do-	Molungyimsen	Ginger	5000 kgs

Source: Directorate of Rural Development, Nagaland, 2012

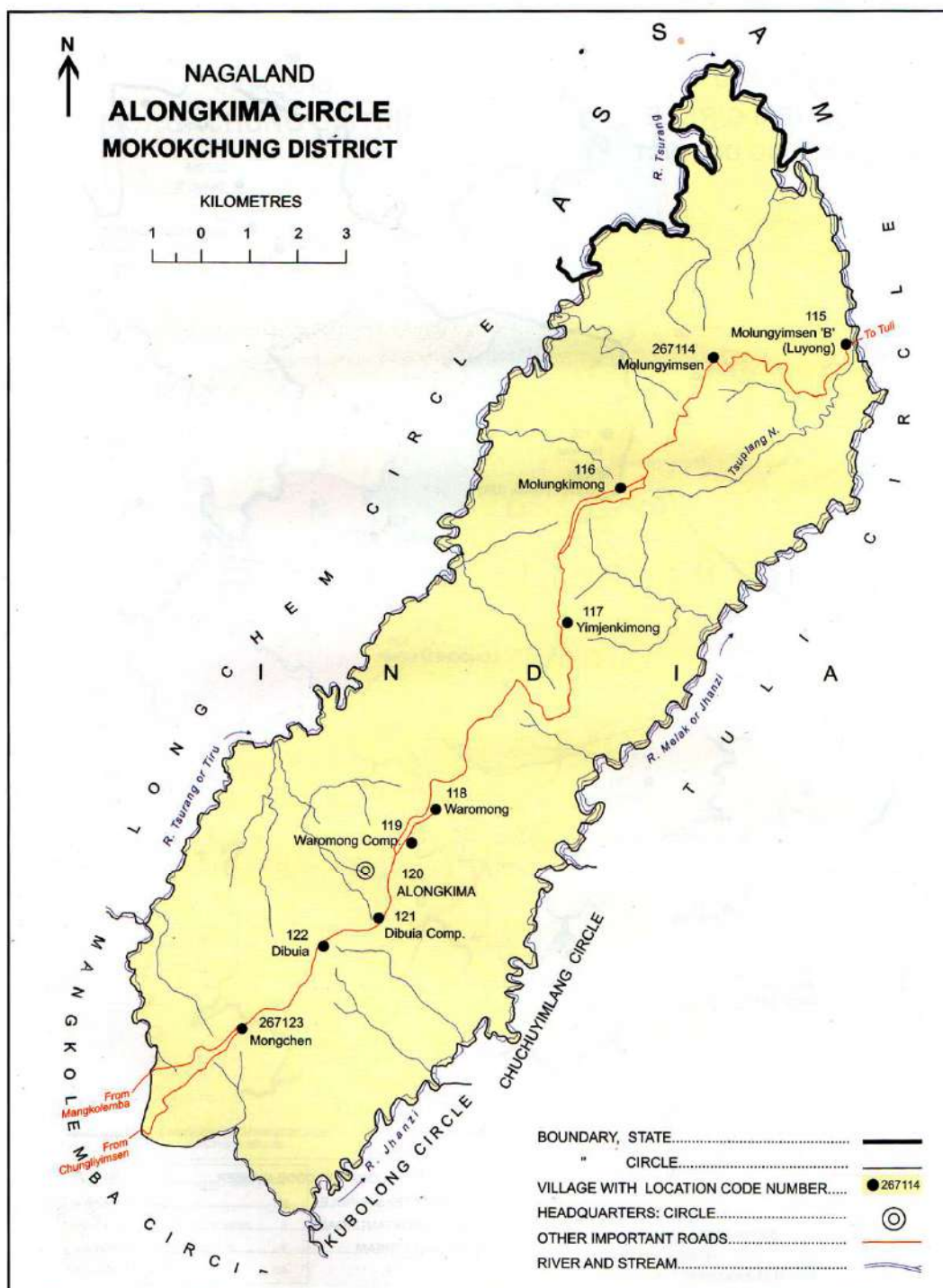


Fig 4.8: Map of Alongkima Circle

Source: Administrative Atlas, Nagaland, 2012

Table 4.7: Agricultural produce from Ongpangkong Circle in Mokokchung**District**

Sl.No.	Name of Circle	Name of Village	Name of products	Total products for sale in kgs
1	Ongpangkong(N)	Ungma	Passion fruits	50,000 kgs
2	-do-	Longsa	1.Green chilly 2.Corn / Maize	70,000 kgs 90,000 kgs
3	-do-	Maolenden	Guava	60,000 kgs
4	-do-	Chuchuyimpang	1.Green chilly 2.Cucumber 3.Ginger	30,000 kgs 25,000 kgs 40,000 kgs
5	-do-	Longmisa	Ginger	45,000 kgs
6	-do-	Mokokchung	1.Cucumber 2.Corn	35,000 kgs 40,000 kgs
7	-do-	Kubza	1.Orange 2.Passion fruits	60,000 kgs 25,000 kgs

Source: Directorate of Rural Development, Nagaland, 2012

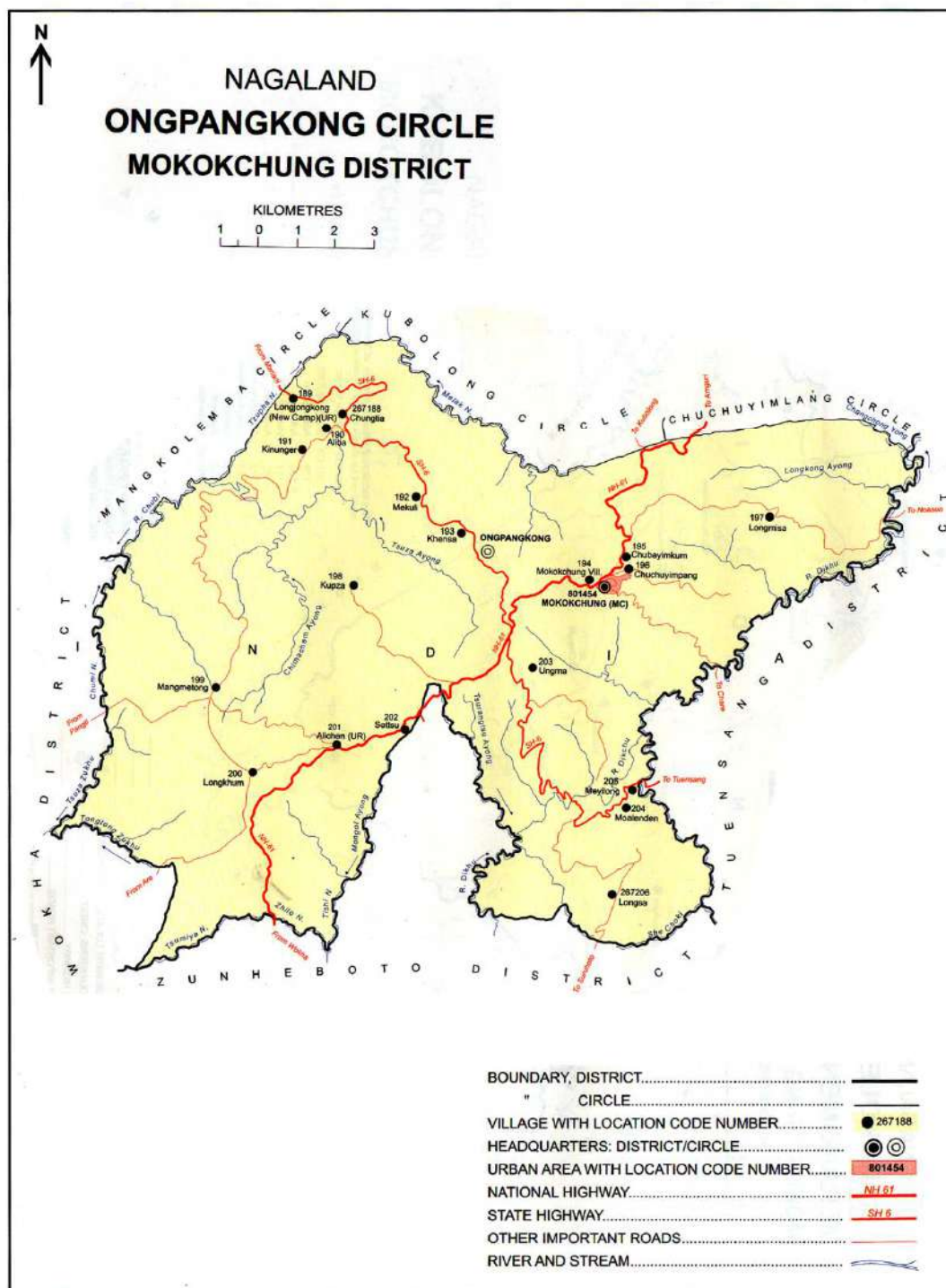


Fig. 4.9: Map of Ongpangkong Circle

Source: Administrative Atlas, Nagaland, 2012

Table 4.8: Agricultural produce from Longchem Circle in Mokokchung District

Sl.No.	Name of Circle	Name of Village	Name of products	Total products for sale in kgs
1	Longchem	Lakhuni	Betelnut B/Leaves	30,000 kgs
2	-do-	Changdang	Betelnut B/Leaves	30,000 kgs
3	-do-	Nokpu	Betelnut B/Leaves	20,000 kgs
4	-do-	Aonokpu	Betelnut B/Leaves	30,000 kgs
5	-do-	Lirmen	Betelnut B/Leaves	20,000 kgs
6	-do-	Saringyim	Betelnut B/Leaves	15,000 kgs
7	-do-	Tsuremen	Betelnut B/Leaves	15,000 kgs
8	-do-	Akumen	Betelnut B/Leaves	15,000 kgs
9	-do-	Yajang(A)	Orange	40,000 kgs
10	-do-	Yajang(B)	Orange	25,000 kgs
11	-do-	Yajang(C)	Orange	50,000 kgs

Source: Department of Rural Department, Govt. of Nagaland, 2012

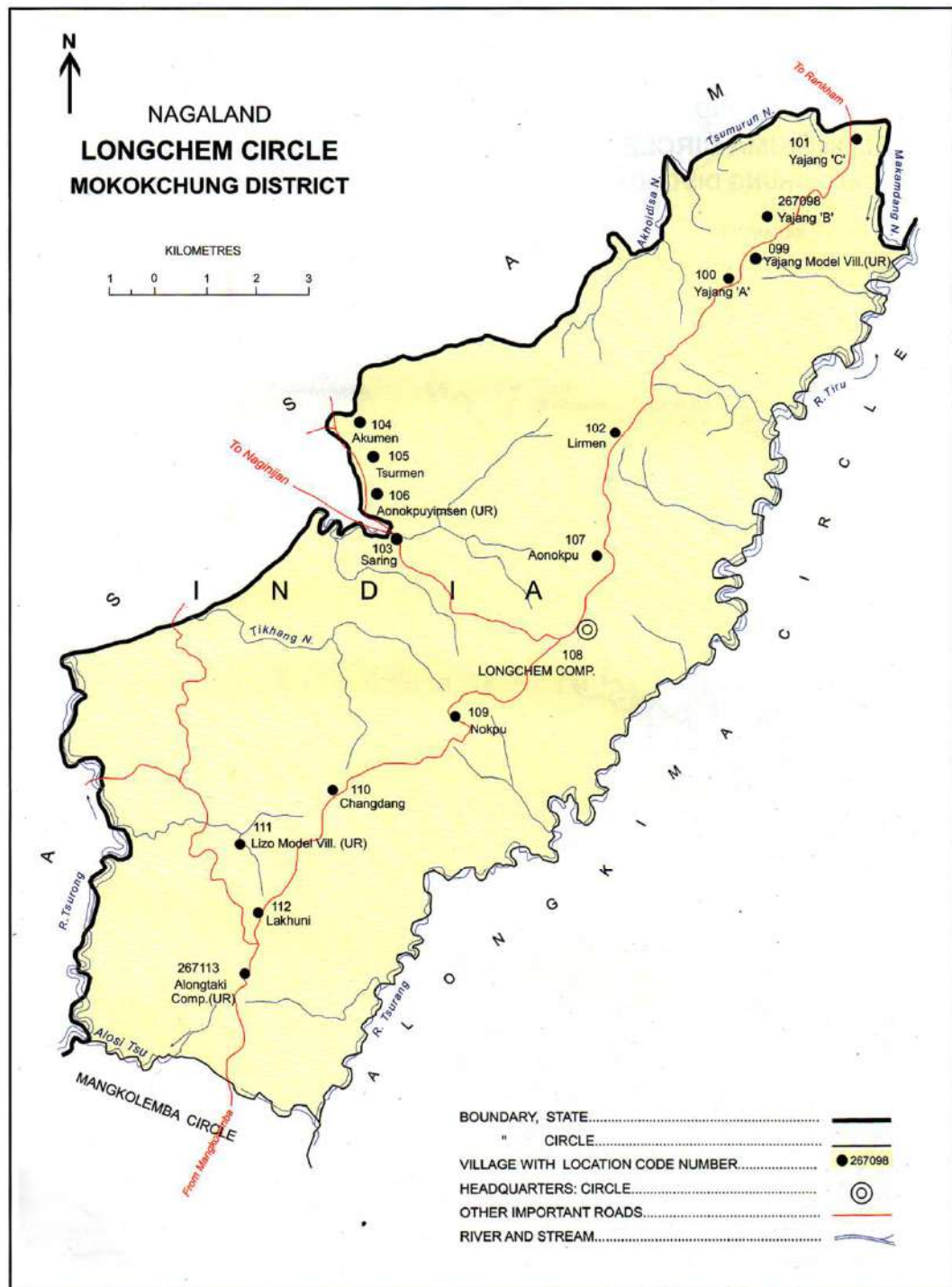


Fig. 4.10: Map of Longchem circle

Source: Administrative Atlas, Nagaland, 2012

4.4 Market centres of the district

Location of markets are to a great extent influenced by the topography in Mokokchung district. As the migration and distribution of the Ao people started from Ongpangkong the highest range situated at the extreme south eastern corner, quite a good number of villages have been established in the range. Gradually in due course of time the other parallel hill ranges of Langpangkong, Asetkong, Changkikong, Japukong and Tsurangkong were also occupied by the inhabitants. These hill ranges decrease in altitude as it proceeds towards the Western margin which merges with the plains of Assam. The district headquarter located on the highest range at an altitude of 1325.08 m above sea level is the main urban centre that caters to the demands of marketing facilities for people not only from Mokokchung but also for people of the districts like Tuensang, Zunheboto and Longleng. The market of Mokokchung town has seen rapid development in the recent past especially after attainment of statehood in 1963. It has road connectivity with Assam the nearest place having railway and airport which help in transportation of goods and services. There is no manufacturing industries therefore the market is totally dependent on the products that are brought from Assam including essential food items like rice, salt, potato, tomato, chilli etc. The local vegetable markets depend on the seasonal crops both cultivated and forest product. Most of the farmers practice jhum cultivation, therefore the produce is very minimal and used for their sustenance only. The villages that are located away from the main town areas cannot bring their item for sale in the market due to distance; cost of transportation and even time is also an important factor as they have to go to the field almost whole part of the year. The

villages that are located toward the outer rim on the western part of the district faces problem due to the physical barrier imposed by the different hill ranges. Therefore in the divisional headquarters like Mangkolemba, Tuli and Changtongya market centres have come up though the frequency of customers and the amount of goods available are much more limited as compared to that of the main town. In the mean time these towns are located closer to the markets in Assam. They have better interrelationship with the people which existed for centuries, therefore they have the advantage of doing business with the people in the plains. Table 4.9 represents the market centres that are developed in the district.

Table 4.9: Marketing centres of Mokokchung District

Sl. No	Name of the market	Periodicity	Commodities marketed
1	Salangtam Market	Daily	Rice, pulses, vegetables, fruits, poultry, meat, fish.
2	Mokokchung Market	Daily & Local weekly	Rice, pulses, vegetables, fruits, poultry, meat, fish, non agricultural commodities
3	Sabangya Market	Daily & weekly	Rice, pulses, vegetables, fruits, poultry, fish, non agricultural commodities
4	Mangkolemba market	Daily & weekly	Rice, pulses,

			vegetables, fruits, poultry, meat, fish, non agricultural commodities
5	Changtongya town market	Daily & weekly	Rice, pulses, vegetables, fruits, poultry, meat, fish, non agricultural commodities
6	Tuli town market	Daily & weekly	Rice, pulses, vegetables, fruits, poultry, meat, fish, non agricultural commodities
7	Khensa weekly market	Weekly	Rice, pulses, vegetables, fruits, poultry, fish, non agricultural commodities
8	Ungma weekly market	Weekly	Rice, pulses, vegetables, fruits, poultry, fish, non agricultural commodities
9	Chuchuyimpang weekly market	Weekly	Rice, pulses, vegetables, fruits, poultry, fish, non agricultural commodities

*Source: ATMA, Strategic research and Extension Plan of Mokokchung District, 2014
Field study, 2010-14*

4.5 Agricultural Produce Marketing Committee (APMC)

The State government realising the need of proper marketing facility have constituted the Nagaland State Agricultural Marketing Board (NSAMB) in 2003 and subsequently the Nagaland Agricultural Produce Marketing (Development and Regulation Act 2005) and the Nagaland Agricultural Marketing General Rules 2006 was passed. To execute and look after the functioning of the NSAMB a Board of Directors was constituted headed by a chairman appointed by the State government with members drawn from few related Agriculture and Allied departments, Ex-officio members including Agricultural Production Commissioner, other members nominated from APMC chairman, representative of NABARD, Registrar of Co-operation and one from Agricultural Marketing Advisor to the Government of India. Under these guidelines 18 Agricultural Produce Marketing Committee (APMC) were established in different parts of the State. The function of NSAMB is to monitor the 18 APMC of the district located at Dimapur, Mokokchung, Wokha, Tuensang, Mon, Zunheboto, Kiphire, Phek, Longleng, Niuland, Jalukie, Pfutsero, Tuli, Tseminyu, Baghty, Tenning, Ghathashi and Kohima. Mangkolemba which was only a sub- yard under Mokokchung APMC was also given full fledged APMC in 2014 thereby making the total number to 19. These APMCs are to facilitate the farmers to sell their produce by contacting genuine traders for timely disposal of their commodity. The marketing centres have been established with the acronym AGRONAG (Agro- Agri & Allied; Nag- Nagaland). These centres will deal with grading, value addition, small scale processing, packaging and marketing of all the products for domestic as well as outside consumption. The NSAMB office is located at North Eastern

Regional Agri. Expo site 4th Mile Dimapur with AGRONAG (Agro- Agri & Allied; Nag- Nagaland) Centre which imparts training to entrepreneur, Self Help group and educated unemployed youth. This centre has Animal feeds processing unit, Turmeric and ginger paste and powder making machine, Citrus juice extractor, Potato chips making machine, Soya milk processing equipment, Rice mill (Medium scale), Spice drying machine, Pineapple juice extracting unit, Popcorn processing unit, Noodles making machine and Grading machineries.

The first Agricultural Produce Marketing Committee (APMC) a whole sale market was established at Mokokchung and the market complex was inaugurated only in 2005 after which various agricultural commodities are being marketed. It has internet facilities with well furnished office building and conference room. There are two storage go-down with a capacity of 200 metric tonnes including cold storage, 8 marketing shed used for collection, grading and storage having a capacity of 240 metric tonnes, 1 auction platform for auctioning of the commodities which can accommodate 100 traders, 2 drying yards used for drying and value addition with a capacity of 20 metric tonnes and a saw mill to make wooden crates for packaging the produce which can make upto 100 crates per day. The district has two more APMC, one located at Mangkolemba and the other one at Tuli sub- divisional headquarter. These two APMC though they have separate Committee the infrastructure is not properly established. At Tuli one office complex cum meeting hall and a drying yard has been constructed but in Mangkolemba till today the functioning of APMC is attached to the Sub- Divisional Agriculture Office (SDAO) Mangkolemba as there is no separate building constructed for APMC.

4.5.1 Mokokchung APMC

The district is classified into three Agro-Ecological Situation based on the altitude- AES-I below 500msl, AES-II between 500-1000msl and AES-III above 1000msl (Agricultural Technology Management Agency, 2014). In all these three AES it has been observed that certain crops are grown according to its situation and thereby those crops are found to be more adopted to that environment. Under APMC Mokokchung Sadar the common agricultural produce that is being marketed includes Ginger, cucumber, banana, green chilli, squash, passion fruit, tomato etc. In 2014 APMC Mokokchung has despatched 37 metric tonnes of ginger that comes mostly from villages of Sungratsu, Longjang, Longkong, Longmisa, Chuchuyimpang, Ungma, Mokokchung, Longsa, Mangmetong, Chuchuyimlang; 52 metric tonnes of turmeric, 77 metric tonnes of squash, 105 metric tonnes of tomato, 2 metric tonnes of chilli and 175 metric tonnes of tapioca (APMC, Mokokchung, 2015). People from Tuensang district also bring their agricultural produce like Kholar and exchange it with other agricultural produce that are grown in Mokokchung district.



**Plate 4.19: Agricultural Produce Marketing Committee (APMC) Office
Building, Mokokchung**



Plate 4.20: Market Shed at APMC, Mokokchung



Plate 4.21: Weighing Bridge at APMC, Mokokchung



Plate 4.22: Auction Platform at APMC, Mokokchung

4.5.2 Mangkolemba APMC

In Mangkolemba though the infrastructure is not established the potential crops for this region have been identified. It comprises of four administrative units viz- Longchem, Alongkima, Merangmen and Mangkolemba covering 40 villages. Important commercial crops include paddy, maize, mustard, orange, tea, potato, ginger, millet, jobs' tears, wheat, colocasia, soyabean. The marketable surplus production from the area includes ginger, orange, tapioca, betel nut, betel vine, and banana. This region is suitable for the cultivation of betel nut and betel vine such that in almost all of the villages many families have started plantation of these crops in the backyard or even in the kitchen farm which provide supplementary income every year and some have even started commercial farming in large plot of land. Exchange of agricultural produce with the people of the plains have been carried out from time immemorial and even today rice, vegetable items like potato, tomato, chilli, onion etc., brought from Assam are exchanged with betel nut, betel vine, orange, ginger etc. Rubber plantation is another important cultivation that has been taken up in these areas especially in villages like Moayimti, Medemyim, Longpayimsen, Yajang, Nokpu, Saring, Waromung and Changki. In the foothill region tea is also cultivated by the villagers.

4.5.3 Tuli APMC

The APMC at Tuli is also in its initial stage. The potential crops include ginger, colocasia, tapioca, turmeric, betel nut, tea and recently cabbage, broccoli have been introduced. Rubber plantations have successfully started but due to the

recent decrease of demand for natural rubber and the lowering of price the farmers are finding difficulties in its marketing. Tea is an important cash crop which grows very well in this region. There are two tea factory set up which can processed the tea that are produced from the farms of the villages like Merangkong, Chuchuyimlang, Changtongya, Yaongyimsen, Liroyimti, Nukshiyim, Luyong, Aobenzu, Kangtsung, Wameken, Yisemyong etc. At Merangkong village the tea farmers have formed a Tea farmers Association. They use to organise various training and workshop relating to tea farming and the member also update their skill by attending such programme in other parts of the country. Today most of the tea growers are skilled farmers and they have resolved that only organic farming should be adopted though it is labour intensive.



Plate 4.23: Agricultural Produce Marketing Committee (APMC) Office Building, Tuli



Plate 4.24: Drying Platform at APMC, Tuli

4.6 Sustainability of agricultural markets

Markets are the link between producers and the consumers. The availability of good market centres play a pivotal role in the development of any production unit so also to the agricultural sector which encourage the farmers to produce more where he can earn profit. The total dependence of the people on environmental factors in the district of Mokokchung is one of the major concern that has resulted in the underdevelopment of marketing facilities. The existing practice of jhum cultivation has some major setback in the economic aspect. It requires the shifting of the field every two to three years which has now reduced to two years at the maximum due to the low productivity. The top soil is eroded at high rate as the protective cover is removed by cutting of the forest and burning after which the soil is loosen with

various implements for sowing the seeds. The loose soils are subjected to wind and water erosion during the monsoon season aggravated by the steep slope thereby making the land barren. The method of cultivation is mostly mixed cropping with paddy as the major crop and other subsidiary crops include vegetable items. Use of fertiliser and pesticide is negligible or even nil in many of the fields. The farmers often use salt in areas where the weeds cannot be controlled or they use it to enhance the yield. It has been reported that though the use of salt increases the yield, the quality of rice is compromised as the food gets spoilt very fast. The quality of soil also deteriorates as it affects the earthworm which is a natural source that helps in the nourishment of soil. The farmers use indigenously available seeds that takes almost the whole year for one harvest and the production is low. It can barely satisfy the requirement of the farming family which hampers the market and therefore the vegetable markets are mostly dominated by the products that are brought from Assam. The market is not only for the sale of the agricultural produce but various agricultural tools and implement required in the farming as well as the modern facilities to enhance production without harming the environment needs to be transacted which will go hand and hand in its development. Commercial farming needs to be developed for cultivation of one particular crop and modern scientific technologies have to be introduced so that the farmers can enjoy a good yield and ultimately improve in the marketing of the produce to earn maximum benefit and uplift the living condition. The sustainability of agricultural market also to a large extent depend on the transport facilities of an area. Since the agricultural produce are susceptible to pest and even weather phenomenon, the harvested products should be transported and stored at proper place. This brings into prominence the importance of

good storage and transport facilities. The distribution of crops to those areas of deficit production can also be maintained with the availability of good transport.

4.7 Concluding Statement

The analysis of marketing structure in Mokokchung district have revealed that the market system is still at the initial stage of development and needs to be thoroughly restructured to address the various impediments faced by the rural people. There is lack of marketing education and co-ordination among the various agencies which is exploited by the people coming from outside the State who dominates the system at present. The market is almost totally dependent on the products that are brought from outside the State which has resulted in the monopoly of the marketing system. Most importantly, rice and vegetable items like those of potato, tomato, chilli, onion, cabbage etc., which forms the basic food requirement are all brought from other States. In the mean time, though the district is gifted with a favourable agro climatic condition where a variety of naturally occurring resources are abundant and a variety of crops been cultivated, the farmers are unable to capture the market. The local vegetable markets are all dependent on the seasonal crops. Of the various reasons, one impending issue is the practice of the traditional method of cultivation i.e., jhum which is not only unproductive but destroys the ecosystem by means of biodiversity loses, soil erosion etc. The production is mainly subsistence thereby marketable surpluses are very minimal and even if the farmers produce surpluses they are unable to sell it as they cannot bring to the market due to distance and transportation problem. It is worth mentioning that in Longmisa village which is

about 16 km away from the district headquarter, every year in the jhum field the farmers have excess production of cucumbers which are cultivated along with paddy but due to lack of proper marketing facility, transportation and the distance of the village from the main marketing centre they were unable to sell it and most of the produce were wasted. But from the year 2010 the opening of Wednesday weekly bazaar by Watsu Mungdang in the main town has enabled the farmers to bring their produce once a week and sell it. The initiative of the Watsu Mungdang have encouraged many of the local farmers and at present the response is tremendous as people even from outside the district i.e., people from the villages of Tuensang, Longleng, Wokha and Zunheboto bordering with Mokokchung district are bringing their produce to this weekly market. This indicates that if proper marketing facilities are provided the farmers can concentrate in the cultivation of crops depending on the location and climatic conditions. When the production increases and the quantity becomes large, distance of the village from the marketing centre will not be a problem as they can combine together and hire vehicles for transporting their produce to the market place.

The marketing structure comprising of daily, weekly and roadside market serve the requirement of the people which consist of local and non local traders. In all of these markets the local vegetables traders does not use standard weight which result in disparity of price of the items that are sold. It has been observed that in a stall the same item measured by means of a plate vary in the quantity but the price for it remains the same, while the size of the plate are also not the same in all the stalls therefore for some items the customer pays more price than the worth of the item or in some instances the trader gets less than the worth of the item. In case of

leafy vegetables also bundles of different size though it may not vary much are sold at the same price. There are also instances for some items like cucumber, plantain inflorescence, squash, pumpkin, gourd etc which are sold according to the size. A single piece or two to three pieces may cost 30 rupees in one stall where as in another stall it may cost 20 rupees. To control the disparity and maintain uniformity for the benefit of the farmer as well as the customer, the APMC can play a vital role. Till today the three APMC in Mokokchung district cannot function fully due to fund constraint and the lack of marketing knowledge among the people of the district. Even though the marketing committee have been set up in all three APMC there is no infrastructure in Mangkolemba and Tuli. At Mokokchung APMC there are few facilities but due to various technical reasons it cannot be used and thereby most of the facilities are unused or even getting damaged.

The success of APMC will depend on the farming community to a large extent therefore it is very important that the farmers are motivated and encouraged to cooperate with the APMC and work together for the benefit of all stakeholder. In 2006 with the initiative of the APMC Mokokchung the farmers produced quite a large quantity of ginger from Mokokchung district but due to competition in the global market they were unable to sell the ginger in the market resulting in financial lose as well as it discouraged many of the farmers. Therefore all such eventuality should also be taken into consideration while planning for the development of the marketing by setting up proper storage system. The marketing system at present is not sustainable, since it is dependent on the outside market and the production from the local farmers are mostly for sustenance and very few items that are brought to the market consist of local vegetables only. The cultivation and successful production of

tomato, potato and cabbage at Longkhum village located at the highest altitude of the district have proved that the climatic and soil condition are favourable for the cultivation of these crops, therefore a concerted effort needs to be adopted by the farming community with a strong marketing agency to take up commercial farming of these crops and thereby minimise the dependency on the other States.

Chapter-5

**Transport Network and its Impact
on marketing of agricultural
products**

5.1 Introduction

Transportation of raw materials to the place of production and finished products to the market requires good network of transport system. The transport also helps in the better and fuller utilisation of resources of any backward region by linking the same with the relatively more advanced and developed one (Tiwari, 2015). A major portion of Mokokchung district is mountainous and hilly, therefore roads are the only means of transport. Movement of people, goods and services are totally dependent on this mode of transportation in this part of the country. Importance of road connectivity is a vital issue which needs to be addressed and given the highest priority by all levels of authority. It is so true that roads are the symbol of National development. Roads are the only means through which every village and hamlet can be connected. According to Husain (2008), India has one of the largest road networks in the world with an average distance of 3.35 million kilometre. Roads in India connect village to village, and village to urban centres. Moreover roads offer door to door services and their construction can be undertaken even in areas of difficult terrain and steep slopes. The movement of goods is safer through road transport. They help the farmers to move their perishable commodities to the urban markets.

Agriculture is the mainstay of economy in the district as there is no industry worth mentioning. It had one Pulp and Paper industry at Tuli and one Fruit Canning industry at Longnak but both remain defunct due to various reasons. The people therefore had to rely on agriculture as their primary source of income which needs a well maintained transport facility since the agricultural products are all perishable.

The influence exerted on the sale of agricultural produce by the road network can be clearly observed from the fact that those villages located close to the National Highway and the State Highways have constructed both permanent and temporary structures of marketing shed along the road sides where the farmers bring their produce from the field and sell it to the commuters. While people from the villages located near the district headquarter and divisional headquarters take their produce to market place where they sell it or give it as whole sale to the traders who have permanent stalls in the market place.

5.2 Development of Transport network in Mokokchung

Compared to the rest of the country transport network of the district is still at the primary stage. The restriction imposed by the physical relief and the isolation from the mainland have all added to the poor condition of transport facility. At this fast changing world, roads are the only means that exist today in the district through which movement of goods and service takes place. In the past decades the people used tribal track and traditional path that were constructed by the villagers. These small tracks were used by messenger, warriors and sometimes traders who use to go down to the plains of Assam for exchange of goods through barter system. As these small tracks were very vital the village male folk of different age group used to clear it once every year. In most of the cases, as it was observed the villages have boundary marked by a stream or a river, therefore every village would clear the path upto the river so that there is continuity of those tracks from one village to the other. Even today, in most of the villages these roads are still properly maintained. It was

only after the British occupation of this region that modern means of transport and communication started to develop. Those days the only road which linked Mokokchung with other places were Mokokchung to Amguri (Assam) and Mokokchung to Kohima the State Capital via Wokha district and even now these are the major roads that are used for transportation. Extension and widening of the road started after the attainment of Statehood as more developmental works were carried out and the expansion of towns necessitated road connectivity. Towards the early part of 1960s alignment of an important road from Mokokchung to Mariani started. In 1969 Mokokchung- Tuensang road and Mokokchung- Amguri road were declared as State Highway (SH) and recently with the initiative of the Central Government these two roads are declared as National Highways (NH). Today almost all the villages are connected by road with the district headquarter. There is no airport but the Nagaland State Transport (NST) Department have initiated chopper service which is not regular. The district has been touched by a railway track at Tuli on the extreme North Western corner that has stop operating. The nearest railway connection is at Mariani which is at a distance of 85 km and airport at Jorhat about 103 km from the district headquarter. The nearest airport and railway station for the people of Mokokchung in Nagaland is at Dimapur which is 212 km away from the district headquarter.

5.3 Road network of the District

The topography has a direct bearing on the distribution of road network in Mokokchung district. The roads follow the orientation of the ranges and passes along the different villages located on the hill top. The district is connected by National Highway (NH) - 2 traversing the South Eastern end from a portion of Longkhum village that connects from Kohima via Wokha and goes through the North Western part of the district covering a portion of Ongpangkong range and through Langpangkong range and connects with Amguri in Assam. National Highway (NH) - 2 has a total length of 240 km in Nagaland out of which Mokokchung has 115 km stretch starting from 125th km and terminating at 240 km at Nagaland Gate near Amguri, Assam. There is another important road State Highway (SH)-6 (now changed to NH-702D in 2015) starting from Mokokchung Town at the South Eastern part of the district traverse the district towards the South Western part passing through Ongpangkong, Changkikong and Tzurangkong range which connects with the plains of Assam at Mariani. It has a total length of 85 km. This road acts as a life line for the district of Tuensang, Longleng and Zunheboto and it is the only road that pass cutting across the ranges in a transverse manner. The other district road follows the alignment of the range like the one that starts from SH-6 (now NH-702D) at Changki junction and goes through Changkikong range passing through many of the villages like Chungliyimsen, Mongchen, Waromung, Yimchenkimong, Molungyimsen and finally connects with the NH-2 at Tuli. It has a total length of 46 km. Another district road starting from SH-6 (now NH-702D) at Mangkolemba Junction (Longnak) goes through the lower most range i.e., Japukong on the Western

margin of the district that goes via Longchem and connects with NH-2 at Yajang C village. The total length of this road is 52 km. There is also an unsurfaced road from Longtho to Yajang C which has a total length of 54 km.

The total length of road in the state is 14377.50 km out of which it has 7592 km of surfaced road i.e., 52.81 per cent and 6785.30 km of unsurfaced road i.e., 47.19 per cent. The density of road in Nagaland is 86.68 km/100 Sq.Km. The roads are categorised into National Highway (NH), State Highway (SH), Major District Road (MDR), Other District Road (ODR), Urban Road (UR), Town Road (TR), Village Road (VR) and Different Department Road (DDR).

Table 5.1: Classification of Roads in Nagaland

Sl.No	Category	Total Surfaced (in km)	Total Unsurfaced (in km)	Total length (in km)
1	National Highway (NH)	830	0	830
2	State Highway (SH)	1207	0	1207
3	Major District Road (MDR)	1447	288.90	1735.90
4	Other District Road (ODR)	1791	1957	3748
5	Urban Road (UR)	398.50	60.80	459.30
6	Town Road (TR)	466	469.80	935.80
7	Village Road (VR)	1385	3107	4492
8	Different Department Road (DDR).	67.50	901.80	969.30
	Total	7592	6785.30	14377.30

Source: PWD, (R&B), Government of Nagaland, 2013

Mokokchung district has four divisions that look after the road network viz- Changtongya Division, Mangkolemba Division, Mokokchung Division and Tuli Division. It has a total road length of 2028.81 km. The coverage of road by the different division are: Changtongya Division- 227.10 km, Mangkolemba Division - 681 km, Mokokchung Division- 685.91 km and Tuli Division- 434.80 km. Table 5.2 shows the summary of road inventory in the district.

Table 5.2: Summary of Road inventory

Name of Division	Category	Surfaced Road		Unsurfaced Road		Total (in Km)
		BT	WBM	Motorable	Non-Motorable	
Changtongya Division	NH	32.00	0.00	0.00	0.00	32.00
	SH	7.00	0.00	0.00	0.00	7.00
	MDR					0.00
	ODR	1.20	20.40	12.30	11.70	45.60
	UR					0.00
	TR	8.50	5.20	9.80	1.50	25.00
	VR	37.30	17.20	49.00	14.00	117.50
	RR					0.00
	DDR					0.00
	Total	86.00	42.80	71.10	27.20	227.10
Mangkolemba Division	NH	0.00	0.00	0.00	0.00	0.00
	SH	46.00	0.00	0.00	0.00	46.00
	MDR	87.00	0.00	0.00	0.00	87.00
	ODR	121.00	13.00	87.00	46.00	267.00
	UR					0.00
	TR	15.00	0.00	13.00	2.00	30.00
	VR	40.50	6.00	37.50	4.00	88.00
	RR					0.00

	DDR			40.00	123.00	163.00
	Total	309.00	19.00	177.50	175.00	681.00
Mokokchung Division	NH	69.00	0.00	0.00	0.00	69.00
	SH	41.30	0.00	0.00	0.00	41.30
	MDR	35.35	12.00	17.00	0.00	64.35
	ODR	92.20	12.00	17.50	18.00	139.50
	UR	98.20	0.50	39.00	2.50	140.20
	TR					0.00
	VR	109.97	24.20	82.22	17.17	231.56
	RR					0.00
	DDR					0.00
	Total	445.82	48.70	153.72	37.67	685.91
Tuli Division	NH	30.00	0.00	0.00	0.00	30.00
	SH	0.00	0.00	0.00	0.00	0.00
	MDR	58.00	8.00	0.00	0.00	66.00
	ODR	0.00	40.00	144.00	31.00	215.00
	UR					0.00
	TR	5.50	6.30	20.50	0.00	32.30
	VR	35.70	6.30	33.50	16.00	91.50
	RR					0.00
	DDR					0.00
	Total	129.20	60.60	198.00	47.00	434.80
Mokokchung District	Total	970.02	171.10	600.32	286.87	2028.81

Source: PWD, (R&B), Government of Nagaland, 2013

5.3.1 National Highways

National Highways are the major road that connects the State Capitals of the country, important cities and ports. It is constructed and maintained by the Central government. Nagaland has a total length of 830 km of National Highway out of which 574.70 km is under the NPWD and 255.30 km under Border Road Organisation (BRO). The National Highway roads that passes through the State are NH-02 Amguri (Assam)-Mao gate (Manipur), NH-202 Mokokchung- Jessami (Manipur), NH-29 Diphu Road Dillai Gate- connecting Jessami at NH-202 (Manipur) and NH-129 Tragopan Hotel (Dimapur)- Nagaland Gate (Golaghat Road). The National Highway passing through Mokokchung district are National Highway (NH)-02 with a total length of 115km and National Highway (NH)-202 that goes through Sewak gate towards Dikhu river covering a length of 27 km under Mokokchung district and State Highway-6 have also been declared as NH-702D.

5.3.2 State Highways

State Highways are the roads that link to all major towns and cities of the State and are maintained by the State PWD. The State has a total of 1207 km State Highway out of which 800 km is under NPWD and 407 km is under BRO. State Highway (SH)-6 (now changed to NH-702D in 2015) stretching from Mokokchung to Mariani with a total length of 85 km is a very important road that passes through the district. One important characteristic feature of this road is that it goes through the ranges of Changkikong, a part of Japukong and Tsurangkong in a transverse manner through which other district roads of Mokokchung gets connected.

5.3.3 Other Roads

Other categories include Major district roads, Other District roads, Urban Roads, Town Roads, Village Roads, Rural Roads and Different Departmental Roads.

Major district roads are the ones that connect all important towns and large village with the district headquarters. It also connects other roads with the State Highways. Through this road the villages that are located on the hill ranges gets connected as in the case of villages located at Changkikong ranges towards the North a district road starts at Changki X junction and connects at NH-2 near Tuli.



Plate 5.1: Changki Junction

Another District road that connects most of the villages in Japukong ranges goes from Mangkolemba junction at Longnak upto Yajang C and joins NH-2.



Plate 5.2: Mangkolemba Road

Village roads are the ones that are constructed and maintained by the village council/ panchayats. The development of a region is greatly influence by the existence of good roads. With the initiative of the Village Development Board (VDB) in many of the villages in Mokokchung district roads are given the primary importance and maintenance works are carried out. The figures in the Tables 5.3 to 5.9 represent the distance of villages from the district headquarters according to different blocks of the district.

Table 5.3: Distance of villages from the district headquarter
(Changtongya Block)

Sl.No.	Name of Block	Name of Village	Distance from district Headquarter to village (in Km)
1	Changtongya	Changtongya(o)	42
2	-do-	Changtongya(N)	43
3	-do-	Yaongyimsen	45
4	-do-	Akhoia	40
5	-do-	Kelingmen	50
6	-do-	Unger	35

Source: Department of Rural Development, Govt. of Nagaland.

Table 5.4: Distance of villages from the district headquarter
(Tuli Block)

Sl.No.	Name of Block	Name of Village	Distance from district Headquarter to village (in Km)
1	-do-	Merangkong	55
2	-do-	Wameken	76
3	-do-	Anaki	91
4	-do-	Kangtsung	82
5	-do-	Asangma	75
6	-do-	Anakiyimsen	86
7	-do-	Anaki(C)	88

Source: Department of Rural Development, Govt. of Nagaland.

Table 5.5: Distance of villages from the district headquarter
(Chuchuyimlang Block)

Sl.No.	Name of Block	Name of Village	Distance from district Headquarter to village (in Km)
1	-do-	Chuchuyimlang	30
2	-do-	Mongsenyimti	25
3	-do-	Longkong	30
4	-do-	Chakpa	40
5	-do-	Yaongyimti(O)	43
6	-do-	Yaongyimti(N)	41
7	-do-	Salulemang	45

Source: Department of Rural Development, Govt. of Nagaland.

Table 5.6: Distance of villages from the district headquarter (Kubolong Block)

Sl.No.	Name of Block	Name of Village	Distance from district Headquarter to village (in Km)
1	Kubolong	Mopungchuket	17
2	-do-	Sungratsu	18
3	-do-	Chami	19
4	-do-	Longpa	23
5	-do-	Longjang	25

Source: Department of Rural Development, Govt. of Nagaland.

Table 5.7: Distance of villages from the district headquarter
(Mangkolemba Block)

Sl.No.	Name of Block	Name of Village	Distance from district Headquarter to village (in Km)
1	Mangkolemba	Changki	45
2	-do-	Chungliyimsen	45
3	-do-	Khar	56
4	-do-	Mongchen	60
5	-do-	Dibuia	65
6	-do-	Waromung	68
7	-do-	Yimjenkimong	70
8	-do-	Molungkimong	88
9	-do-	Molungyimsen	100
10	-do-	Chungtiayimsen	65
11	-do-	Longpayimsen	70

Source: Department of Rural Department, Govt. of Nagaland.

Table 5.8: Distance of villages from the district headquarter
(Ongpangkong North and South Block)

Sl.No.	Name of Block	Name of Village	Distance from district Headquarter to village (in Km)
1	Ongpangkong(N)	Ungma	5
2	-do-	Longsa	30
3	-do-	Moalenden	25
4	-do-	Chuchuyimpang	8
5	-do-	Longmisa	16
6	-do-	Mokokchung	6

7	-do-	Kubza	18
8	Ongpangkong (S)	Khensa	5
9	-do-	Mekuli	8
10	-do-	Chungtia	16
11	-do-	Aliba	18
12	-do-	Kinunger	19
13	-do-	Longkhum	19
14	-do-	Mangmetong	24

Source: Department of Rural Development, Govt. of Nagaland.

Table 5.9: Distance of villages from the district headquarter

(Longchem Block)

Sl.No.	Name of Block	Name of Village	Distance from district Headquarter to village (in Km)
1	Longchem	Lakhuni	78
2	-do-	Changdang	85
3	-do-	Nokpu	90
4	-do-	Aonokpu	98
5	-do-	Lirmen	107
6	-do-	Saringyim	115
7	-do-	Tsuremen	120
8	-do-	Akumen	125
9	-do-	Yajang(A)	115
10	-do-	Yajang(B)	125
11	-do-	Yajang(C)	130

Source: Department of Rural Development, Govt. of Nagaland

5.4 Role of transport network on marketing of rural resources

The distribution and localisation of marketing centres of rural resources in Mokokchung district are to a great extent influenced by the transport network i.e., road which is the only means of transportation. As majority of the people depend on agriculture with very little surplus for marketing and the distance of the villages from the urban areas, market centres have developed at various location on the highway especially at important junction like Changki Junction; at the converging point of many villages on the highway like Changtongya Town and the main Town of the district headquarter. The resources comprise mainly of forest products usually green leafy vegetables, wild fruits, crabs, fish, broom stick etc. Agricultural produce are also marketed by the people of the villages that are well connected by road and located close to the marketing centre.

5.4.1 Changki Junction

Changki junction is located 40 km from the district headquarter. It is half way to Mariani on SH-6 (now changed to NH-702D) and almost all the vehicles plying between Mokokchung and Mariani stop over here for a while before proceeding on the journey. It is also a converging point of many villages of Changkikong range like those of Chungliyimsen, Khar, Dibua, Mongchen, Waromung, Alongkima and Changki who pass through this junction to go to Mokokchung Town. Besides, Taxi, Tata Sumo, Buses, private vehicles and Truckers usually stop at this location. There are few people from Changki village who have settled in the junction doing business. They have opened five hotels, seven general shops and a marketing shed with around

four to five stalls where they usually sell forest products and agricultural produce brought from the nearby villages. A unique item found in this market place is the clay pot made by the Changki people who are well known for this art as they are the only one making it in Mokokchung district. Another item is the fermented crab (ongjang) which is also a speciality of Changki village. The other items includes Spanish joint fir (lilem leaves) and seeds which is found in abundance mostly in the jungle of Changkikong range, Balliric myrobalan (ningkahjang), tsujembi, zanthoxylum (Mangwa) leaves & seeds, Spiny taro (jorang), plantain inflorescence etc. Table 5.10 shows some of the important items on sale during the time of field survey. There were five stalls with almost the same items.

Table 5.10: Rural resources marketed at Changki Junction

Sl.No.	Item	Quantity	Amount	Sale/day
1	Clay pot	1pcs	250-300	Sold worth Rs. 3000 in August 2014
2	Fermented crab (Ongjang)	1bottle	60	20-30 bottle
3	Balliric myroballan (Ningkahjang)	1 Pkt	20	20-30 pkt
4	Tsujembi	1 Pkt	20	20-30 pkt
5	Spanish joint fir (Lilem)	1 bundle	20	40-50
6	Zanthoxylum leaves	1 bundle	20	20-25
	Seeds	1 bundle (dry)	50	10
	Seeds	1 pkt	100/150	5-10
7	Mushijang	1 bundle	20	10-15
8	Spiny taro (Jorang)	1 bundle	20	30-40
9	Plantain inflorescence	1 bundle	30	15-20

Source: Field survey 2010-14



Plate 5.3: Shops at Changki Junction



Plate 5.4: Local vegetables at Changki Junction

5.4.2 Mokokchung Town Daily Bazaar

Mokokchung Daily bazaar is spread over three locations i.e., Salangtam, Old Town hall complex and Kichuchar complex. All these three locations are accessible by road. In Salangtam market there are four local stalls that sell the vegetables daily and the villages from which the produce are brought to the market are Mokokchung village, Longjang, Longpa, Sungratsu, Kelingmen, Chungtia, Kinunger, Khensa, Mongsenyimti, Changki, Longkong, Dibua, Longkhum, Longsa, Chuchuyimpang, Aliba. Items that are available in the market includes green leafy vegetables like squash leave, *Zanthoxylum*, Spanish joint fir (lilem), *Clerodendrum colebrookianum* Walp. (oroma), Aochisang, colocasia leaves, reptsa, *Elsholtzia sp* (napa), Basil (nangpera), etc. Other items are bamboo shoot, moya/anishi, spring onion, cucumber, chilli, squash, colocasia, gourd, ginger, plantain inflorescence, brinjal, maize, sponge gourd, eatable wild mushroom etc.

Table 5.11 and 5.12 shows the different rural resources marketed by the local people and the price as well as the quantity of sale per day on an average at Salangtam market place.

Table 5.11: Green leafy vegetable marketed in Salangtam market

Item (Mongsen)	Source		Quantity	Amount	Sale/day
	Cultivated /forest	Village			
Zanthoxylum leaves (Mangwa)	Cultivated	Longjang Longpa	1 bundle	20	30-40
Aochisang	Cultivated	Longjang Longpa Chungtia Kinunger	1 bundle	20	25-30
<i>Clerodendrum colebrookianum</i> Walp (Oroma)	Cultivated	Mongsenyimti Longjang, Longpa	1 bundle	20	30-40
Spanish joint fir (Lilem)	Forest	Changki Longnak	1 bundle	20	30-40
Squash leaves	cultivated	Mokokchung Khensa Chuchuyimpan g	1 bundle	20	30-40
Colocasia leaves	cultivated	Khensa Kinunger Sungratsu Aliba, Chungtia	1 bundle	30	15-20
Hooker chives (Reptsa)	cultivated	common	bundle	20	20-25
<i>Elsholtzia</i> sp (Napa)	cultivated	common	bundle	20	20-25
Basil (Nangpera)	cultivated	common	bundle	20	20-25

Source: Field survey, 2010-14

Table 5.12: Vegetables and other items

Item	Source		Quantity	Amount	Sale/day
	Cultivated /forest	Village			
Bamboo shoot	forest	common	bundle	50	15-20
Dry bamboo shoot	processed	Kelingmen Wokha	pkt	100	4-5
Moya/ anishi	processed	Sungratsu Kelingmen	Kg/pkt	350-400	3-4
zanthoxylum seeds	cultivated	Kelingmen	pkt	50/100	3-4
Spring onion	cultivated	Khensa Mongsenyimti	Bundle	20	10-15
Cucumber	cultivated	Longkong Khensa Mongsenyimti Dibuia Longkhum	piece	8/Rs.100	50-60
Chilli	cultivated	Longsa Longkhum	plate	50	10-15
Squash	cultivated	Mokokchung Chuchuyimpang Khensa	piece	7-8/Rs 50	40-50
Colocasia	cultivated	Alisopur (Tuensang)	piece	3-4/Rs 50	30-40
Long gourd	cultivated	Mokokchung	piece	20-30	8-10
Ginger	cultivated	common	plate	50	10-15
Plantain inflorescence	forest	Longsa, Khensa	bundle	50	10-15
Brinjal	cultivated	common	plate	20-30	15-20

African egg plant (Longkok)	cultivated	common	plate	20-30	15-20
Sponge gourd	cultivated	common	Piece/ bundle	6-7/ Rs 50	10-15
Maize	cultivated	common	Piece/ bundle	6-7/ Rs 50	10-15
Dry colocasia leaves	processed	common	pkt	30	5
Mushroom	forest	common	plate	50	5-10
Kidney bean (Kolar)	cultivated	Tuensang	pkt	50	5-10
Perila	cultivated	common	cups	20	10
Sesame	cultivated	common	cups	20	5-10

Source: Field survey, 2010-14



Plate 5.5: Salangtem Market



Plate 5.6: Local Vegetables at Salangtem Market

The market at Old town Hall complex comprises of 20-24 local vegetable stalls out of which 14-15 stalls are regular. There are also 5 non local vegetable shops in the complex. It is in the heart of the main Town and the items that were available as well as the source from which it is supplied are almost the same but some more items were found in this complex. Table 5.13 & 5.14 represents the rural resources that are marketed in this market.

Table 5.13: Green leafy vegetable marketed in Old Town Hall complex

Item (Local name in Mongsen)	Source		Quantity	Amount	Sale/day
	Cultivated/ forest	Village			
Yardlong bean leaves	cultivated	Aliba, Chungtia Mongsenyimti	bundle	20	15-20
Bhangara (Enzi)	-do-	Common	-do-	20	20
Aochisang	-do-	-do-	-do-	20	20-25
Spanish joint fir (Lilem)	forest	Changki, Watiyim	-do-	20	25-30
Zanthoxylum leaves (Mangwa)	cultivated	Longjang, Longpa	-do-	20	25-30
Oroma	-do-	common	-do-	20	25-30
Vegetable fern	forest	-do-	-do-	20	15-20
Pumpkin leaves	cultivated	-do-	-do-	20	15-20
<i>Elsholtzia</i> sp (Napa)	-do-	-do-	-do-	20	15-20
Mustard leaves	-do-	-do-	-do-	20	15-20
Squash leaves	-do-	-do-	-do-	20	20-25

Source: Field survey, 2010-14

Table 5.14: Vegetables and other items

Item	Source		Quantity	Amount	Sale/day
	Cultivated /forest	Village			
Spring onion	cultivated	common	bundle	20	20-25
Crushed bambooshoot	forest	-do-	container	500	1-2
Dry bambooshoot	forest	-do-	Kg/pkt	350-400	3-4
Bamboo shoot (Liquid)	-do-	-do-	bottle	30	5-6
Honey	-do-	-do-	bottle	400	3-4
Dry colocasia leaves	cultivated	common	pkt	30	4-5
Colocasia stem	-do-	-do-	-do-	-do-	4-5
Moya/Anishi	-do-	-do-	Kg/pkt	400	5-6
Moya chutney	processed	-do-	pkt	60	5-10
Zanthoxylum seeds	cultivated	Longjang Longpa Yaongyimsen Kelingmen	pkt	50/100	5-7
Nutgall (Tangma)	forest	common	cup	20/30	5-10
Ginger	cultivated	-do-	plate	30	10-15
Perila (Avong)	-do-	-do-	cup	20	8-10
Colocasia	-do-	-do-	plate	30/40	6-7

Plantain inflorescene	forest	-do-	bundle	50	7-10
Eatable wild mushroom	forest	-do-	plate	50	5-8
Pumpkin	cultivated	-do-	piece	40-50	10-15
Long gourd	-do-	-do-	-do-	40	10-15
Kidney Bean (Kholar)	-do-	Tuensang	Pkt/cup	100/25	5/15
Brinjal	-do-	common	bundle	20	15-20
Squash	-do-	-do-	piece	3/Rs 10	50-60
Gooseberry	forest	common	plate	20	15-20
Cucumber	cultivated	-do-	piece	7-8/ Rs100	50-70
Maize	-do-	-do-	-do-	5-6/ Rs50	40-50
African egg plant (Longkok)	-do-	Chuchuyimpang Longkong Mokokchung	plate	20	20-25
Broomstick	forest	common	piece	25	5-10
Broom made of palm	forest	-do-	-do-	30	5-10

Source: Field survey, 2010-14

The third local vegetable marketing centre is located at Kichuchar complex opposite to the New shopping complex. It has five daily marketing shops, where the items sold are similar to the other two marketing centres. One important characteristic of this complex is that these are permanent shops therefore they can keep stocks for a longer period and horticultural crops like banana, papaya, orange etc., are sold in large quantity.

5.4.3 Changtongya Town

Changtongya Town is located on the Central portion of Langpangkong range. It is the sub divisional headquarters of Changtongya Circle and is 45 km away from the district headquarters extending towards Tuli valley. National highway (NH)- 2 passes through the main town and many of the nearby villages including people even from Longleng and Tuensang district bordering with Mokokchung district comes for marketing to this town. Gradually, it has become an important business centre which caters to the need of the people. In view of the increasing demand, in 2006 a weekly bazaar started ever Saturday where traders from Amguri (Assam) brings various items including vegetable like potato, tomato, chilli, onion, brinjal, garlic, long bean, sponge gourd, lady fingers, cauliflower, cabbage, colocasia, cucumber, and fruits like apple, coconut, etc., along with other items like household utensils, clothes etc.

Local farmers have also started bringing their agricultural produce from the nearby village and set up their stall all along the roadside of the National Highway-2 since there is no proper marketing shed constructed. The farmers who come for marketing are from Mongsenyimti, Yaongyimsen, Unger, Akhoia, Kelingmen, Merangkong, Yachem from Longleng district who usually brings colocasia and kidney bean (kholar) in large quantity. Cane baskets were also brought from Angangba village which is in Tuensang district. The items that are brought by the farmers include rice, sticky rice, gooseberry, zanthoxylum leaves and seeds, winged bean, passion fruit leaves, bamboo shoot (Fresh and dry), moya/anishi, pumpkin including leaves, long gourd, local coriander, squash leaves, ginger rhizome and flower, colocasia including leaves and stem, vegetable fern, sponge gourd, oroma, eri

silk worm, cucumber, plantain inflorescence, chilli, mustard leaves, bitter gourd, spring onion, bhangara (enzi), axone, walnut, brinjal, *Elsholtzia sp* (napa), basil (nangpera), hooker chives (reptsa), cowhage, squash, spring onion, fruits like banana, lichi, pineapple, pear, jackfruit, guava, orange, papaya. Wild fruits are also brought by the farmers which include balliric myroballan (ningkahjang), nungjalashi, oksi, surajang, nutgall (tangma), angjongmeshila (many of the names of fruits and vegetables are given in local dialect in Mongsen/ Chungli due to unavailability of literature).

Other items include broomstick, crab, frog, local fish, honey, tree bean (yongchak). Almost all the items are sold without the use of weight balance but some of the farmers were seen using a traditional weight balance to measure squash and ginger. Apart from the weekly market, there are 12-13 stalls who sells local produce daily. In Changtongya market also the price of the vegetable items are more or less the same with those of the other markets of the study area. Table 5.15 and 5.16 shows some of the common rural resources marketed by the local people and the price as well as the quantity of sale per day on an average at Changtongya Town.

Table 5.15: Some common Green leafy vegetables marketed at Changtongya Town

Item (Local name in Mongsen)	Source		Quantity	Amount	Sale/day
	Cultivated/forest	Village			
Pumpkin leaves	Cultivated	Mongsenyimti, Kelingmen	Bundle	20	20-30
Colocasia leaves	Cultivated	common	Bundle	20	15-20
Long bean leaves	Cultivated	Mongsenyimti, Kelingmen, Akhoia, Unger	bundle	20	20-25
Reptsa	Cultivated	Common	Bundle	20	15-20
Spring onion	-do-	-do-	-do-	20	15-25
Bhangara (Enzi)	-do-	Common	-do-	20	25-30
Zanthoxylum leaves	cultivated	Kelingmen	-do-	20	20-30
Oroma	forest	common	-do-	20	20-30
Vegetable fern	-do-	-do-	-do-	20	15-20
Napa	cultivated	-do-	-do-	20	15-20
Nangpera	cultivated	-do-	-do-	20	15-20

Source: Field survey, 2010-14

Table 5.16: Some common Vegetables and other items sold at Changtongya**Town**

Item	Source		Quantity	Amount (in Rupees)	Sale/day
	Cultivated /forest	village			
Ginger	Cultivated	Mongsenyimti, Changtongya, Akhoia	plate	30	15-20
Bambooshoot	Forest	-do-	pkt	100	5-7
Colocasia	Cultivated	Yachem, Mongsenyimti, Yaongyimsen	-do-	-do-	4-5
Dry colocasia leaves	cultivated	-do-	pkt	30	4-5
Kidney Bean (Kholar)	-do-	Tuensang	cup	30	15-20
Pumpkin	cultivated	Mongsenyimti, Kelingmen, Changtongya, Unger, Akhoia	piece	30-40	10-12
Gooseberry	forest	Common	plate	20	10-15
Nutgall (Tangma)	forest	-do-	cup	20/30	5
Plantain inflorescene	forest	-do-	bundle	30	10-15
Maize	Cultivated	-do-	-do-	30	30-35
Brinjal	-do-	common	bundle	20	10-15
Cucumber	-do-	-do-	piece	8-9/ Rs100	40-50
Longkok	-do-	common	plate	20	10-15
Broomstick	forest	common	piece	20	5-10

Source: Field survey, 2010-14



Plate 5.7: Local vegetable market at Changtongya



Plate 5.8: Roadside marketing of vegetable items at Changtongya

5.5 Maintenance and Management of Roads

Roads are undoubtedly the most reliable means of transport especially in a region where other types of transportations are not available and provided it is maintained properly and pliable in all weather conditions. The difficult terrain of Mokokchung district has imposed restriction on the development of railways and airports, therefore roads become the most important assets for all sorts of developmental activities and for the uplift of the people.

A characteristic feature of the road is that it follows the contours of the relief and in a region where steep slope and rugged terrain exist the alignment of the road becomes very crucial and it turn and bends along with the topographic feature. The cutting of the road becomes difficult as the gradient of the slope in some of the portion are so steep making the road very narrow and coupled with that, the persistent rain for almost six to seven months in this part of the region during the monsoon season, results in the occurrence of heavy landslide from both sides of the road. The condition is aggravated more by the presence of tertiary sediment as it contains loose material making the soil unstable and deteriorates the condition of the roads.

Lack of proper drainage is another factor that is responsible for damage of the roads as during monsoon rain the run off of water is made to flow on the road. Gradually this makes the material of the road loose and eventually it is washed away making the road more or less like a stream. The minimal drainage constructed along

the road are also blocked by landslide which remains unattained for a long period. This in the long run lead to over flow of the drainage water and damage the road.

With all the physical and natural constraints poor workmanship also compounds to the problem of poor road condition in the district which is prevalent in almost all part of the State. Nagaland has a peculiar pattern of land ownership. The land is owned either by the village community as a whole or by a clan within the village or by individuals. There are no records for conferring such ownership rights, but the individual rights are exclusively determined by tradition which is also referred to as 'customary laws'. These Customary laws are un-codified and yet very effectively applied and interpreted by the traditional village council in the event of any dispute. Moreover, special provisions have been attributed to the State of Nagaland and the people by Article 371(A) of the Indian Constitution. It guarantees that no Act of Parliament in respect of religious or social practices of the Naga customary law and procedure, administration of civil and criminal justice involving decisions according to Naga customary law, ownership and transfer of land and its resources, shall apply to the State of Nagaland unless the Legislative Assembly of Nagaland by a resolution so decides. The customary Rights enshrined in the Indian Constitution and the liberty fully given to the people of Nagaland has to be understood carefully and judicious use of this should prevail in the interest of the people in general so that developmental works does not get hampered whereas the Rights of the people are also protected.

In almost all of the developmental activities the interference of the land owners have been a major setback whereby contract work and implementation of

schemes cannot be carried out as a result of which progress remains stalled and most often the works get diverted or abandoned. The Mokokchung – Amguri road after it was declared as National Highway (NH)-2 widening and construction works have been going on and today it is the only two lane road that passes through the district and may be one of the well maintained roads in the whole of the State. The whole stretch of 115km length within Mokokchung district is maintained by the State PWD (National Highway). The success of the development being carried out for the construction and maintenance of the NH-2 can be attributed to the concern and support given by the villages under its jurisdiction not to impose tax on the improvement and maintenance of the highway. The other important road that connects the district with Assam on the South Western part at Mariani is the State Highway-6 (now NH-702D). This is the main artery of transportation for the district but till today it remains a single lane which carries almost all the mode of land transport ranging from light motor vehicles to heavy load carriers like truck and buses.

With the rapid urbanisation of Mokokchung Town, the district headquarter demands transportation of building materials like sand, bricks, cement, iron rod and all other requisites to be carried through road as there is no railway connection. Apart from the building materials, a majority or almost all the entire population of the town rely on the products that are brought from Assam and other States. Therefore, everyday around 15- 20 truckloads of essential commodities are transported on this road. The same or maybe a little less than the frequency of transporting materials to Mokokchung are also going on for the district headquarters of Zunheboto and

Tuensang, as these towns also depend entirely on the commodities that are brought from outside the State. The entire length of 85km from Mariani to Mokokchung was maintained by the Border Roads Organisation (BRO). Considering the importance and the need for the maintenance of this road, every possible effort needs to be taken up for the benefit of all the people that are dependent on it. Due to various problems and hardship faced by the people while crossing Assam because of frequent bandh and interstate boundary issues, the Foothill Road Project was started with the initiative of the people mostly affected that include ten tribes viz- Ao, Sumi, Lotha, Konyak, Phom, Rengma, Sangtam, Chang, Yimchunger, Khiamniungan.

To oversee the construction of the road successfully, the Nagaland Foothill Road construction Committee (NFHRCC) comprising of representatives from all the ten tribes was set up. According to a rough estimate of the proposed route compiled by NFHRCC, the approximate distance is about 250 km. The road alignment will pass through:

Mon sector- From Tizit HQ (Forest colony) to Tiru- Naginimora- Dikhu river;

Longleng sector- From Dikhu river to Sethep to Yanglok;

Mokokchung sector- From Anaki C, Kangtsungyimsen to Wamakenyimsen, Tuli Paper Mill (Tzudikong, AM road to NH-2; to 8th mile Junction to Yachang C via NABARD road; to Longtho to Changki MI project);

Northern Sumi and Wokha sector- from Old and New Wozhu via Sumito to Changpang (ONGC) Merapani to Governors Camp (Liphayan) to Yanpha to Rengmapani to Niuland (Dimapur).

This road if completed will ultimately shorten the distance connecting all the Eastern and Central part of Nagaland with Dimapur the commercial hub of the State without passing through Assam.

5.6 Concluding Statement

The nature of topography and the physical barrier of the district have restricted the development of other means of transport network except the road and the establishment of most villages on the hill ranges necessitate the construction of roads that cut across the length and breadth of the entire district.

At present, the entire 108 villages of the district are connected by road. Many of the villages realising the need of good road for transportation have judiciously utilised the village development fund for construction of road and have purchased VDB buses. This has ultimately encouraged the farmers to bring their agricultural produce to the urban centres like Mokokchung Town to sell it in the market which was not possible at all as they were unable to hire a vehicle just for some small quantity of vegetables. In certain cases the development of the road is hindered due to inter village dispute with regard to land ownership or the inability of the concerned village to maintain the road due to financial constraints and distance factor as some of the villages are located in remote places. Negligence by the concerned authority is also another factor that is responsible for the deplorable condition of the road in many parts of the district.

A major district road from Changki Junction passing through the Changkikong range connecting with NH-2 at Tuli on the North and another district road from Mangkolemba Junction passing through Japukong range which also joins the NH-2 at Yajang C are two important roads that requires urgent repairing because these regions have scope for development of horticulture, tea plantation, rubber, betel nut, betel vine etc.

The Tsurang valley which has a great potential for development of agriculture, in fact the most fertile region of the district remains neglected. The road is unmetalled and maintenance is very poor, therefore the farmers who cultivate there have to struggle on their own. In spite of all the favourable agro climatic conditions, agriculture which is the main occupation in the district remains undeveloped and totally dependent on other States. Extension of the road to all areas where permanent cultivation is possible, needs to be taken up with the co-operation of the village community, because the existing land holding system hampers the efforts for the development of large scale commercial farming as land belongs to individual and the different clans.

The study has revealed that localisation of market centre along the different route in the district acts as a medium for advertising the speciality of that location. In Changki Junction the travellers passing through this road get the opportunity to buy certain items like earthen pot for which the Changki villagers are well known, ongjang (M) the local name for fermented crabs, Spanish joint fir (lilem leaves) which grow in abundance in the area. Changtongya town is known for its large scale production of horticultural crops like banana, litchi, pineapple and orange. Banana

chips produced from Changtongya are marketed in Kohima, Dimapur and Mokokchung. The distribution of all the items are made possible by the existence of a good transport network as can be observed from the fact that vegetables cultivated in Mokokchung are sent to Kohima and Dimapur which are readily available fresh by noon while people from other districts like those of Tuensang, Longleng and Wokha also bring their produce for sale in the market at Mokokchung town.

Chapter-6

Summary and Conclusions

Summary and Conclusions

To summarise the present study on the Rural Resource Marketing and the Role of Transport Network in Mokokchung District, a comprehensive overview of the finding is presented with the aim to understand the present resource position and its marketing. Mokokchung district is located in one of the most diverse geo-ecological environment of the Eastern Himalayan biodiversity zone and experience monsoon climate. It is divided into three Agro Ecological Situations (AES) with the climatic variation ranging from tropical to sub-tropical. The topography is mostly hilly with few patches of fertile river valley located on the Western margin bordering the State of Assam. Vegetation is rich and varied which the people of the district have exploited to a large extent. Many of the fauna have decreased in number or even disappeared which was found to exist in the past. The forest abounds with a variety of medicinal plants used by the people with the indigenous knowledge acquired through generations of experience.

The practice of shifting cultivation where the fields are rotated in a cyclic manner following a proper sequential order have continued for generations. This method of cultivation have resulted in the exploitation of the entire land occupied by the people of the district and therefore almost a major part of resources available have been in used and they have acquired indispensable knowledge on the properties of almost all plants and there utility. Even the most rugged and difficult terrain which are unsuitable for cultivation are explored by hunters and gatherers who roam in the jungle for game and in search of eatable wild plants and fruits. The study has revealed that there are as much as 11 green leafy vegetables and 17 wild fruits and

other items like fan palm, broom grass, Chinese cinnamon, walnut, different varieties of eatable mushroom like Jungko (Mongsen), mani (Mongsen), zena (Mongsen), avo narong (Mongsen) , onghok (Mongsen) and various other fodder plants obtained from the forest in Mokokchung district. The cultivated crops include 46 vegetables, 70 varieties of rice, and 7 plantation crops. Extensive collection of samples have been carried out and documented and yet there may still be more to include. It has been observed that even a small plot of land can grow as much as 15-20 varieties of plants which indicates that the soil, climate and environment are suitable for the growth of all such plants and if proper system of farming is taken up, the production of those crops can be done on commercial scale.

The vast variety of these natural resources have been a source of livelihood for the people of the district and cultivation was subsistence in nature therefore marketing of the produce was not common among the people. Trade on barter system was carried out between the people living in villages bordering the plains of Assam for a long period and even from the hills they used to go down to exchange their agricultural produce with items that were not available in the district.

Due to the inability to produce surplus production and the distance of the villages from the urban centre of Mokokchung town, marketing system has not developed in the district and is still at the primary stage. The villages that are located close to the town have started to sell the surplus produce and it was observed that some of the farmers have shifted to cultivation of vegetable crops due to the increase in its demand.

The marketing structure is not organised therefore there is disparity of price with the use of locally available means of measurement like those of plates, cups and fixing of price by the farmer on their own depending on the availability of the produce.

Three types of marketing systems have been identified viz- Daily market, Roadside market and Weekly markets. In the daily and weekly market both local and non local vegetable stalls were observed. The local vegetable stall in the daily market have two groups- the first group are vendors who comes to the market place as and when they have enough produce that can be sold after satisfying their needs at home and the other group are the ones who have permanent stall with permit obtained from the Mokokchung Municipal Council (MMC). Those traders who sit in the permanent market stall have link with the farmer from different villages and they get the supply from them.

There are three daily vegetable marketing centres in Mokokchung main town viz- Salangtem bazaar, Old town hall bazaar complex and Kichuchar complex. Marketing centres have also developed at the divisional headquarters of Mangkolemba and Tuli. In the main town the marketing of local vegetables are daily except Sunday which remains closed. At Mangkolemba and Tuli it is mostly done along with the weekly market.

The non local vegetable shops are managed by the non locals and the products are also brought from outside the State. These shops have trade permit obtained from Mokokchung Municipal Council and the price are controlled from time to time by the Council. Since they are dependent on the supply of the

agricultural products from outside, the price fluctuate so much so that at times even within a fortnight the price of the items becomes double and even triple, for instance during the monsoon season due to heavy flooding in the plains there is crop damage and the supply gets effected as a result of which the price of vegetables becomes so expensive that a kilogram (kg) of chilli will cost 80-100 rupees which normally are sold for 25-30 rupees. At the local vegetable stalls in the meantime a plate of chilli is sold for 20 rupees. The quantity of chilli in one plate weights approximately 500gram. The market rate of chilli at that same time was 80 rupees per kg in the non local vegetable shops. Therefore comparing the price of the same commodity at the same time gives a staggering difference of rupees 40 as the chilli in the local stall will be costing only rupees 40 per kg. While at times when the supply of chilli improves it will cost roughly around 25-30 rupees whereas the same price of 20 rupees per plate will exist at the local vegetable market which will cost the same rupees 40 per kg, thereby the price becomes more than the non local shops. The price of other vegetables that are sold in the non local vegetable shops keeps changing depending on the market from which they bring the commodity. While its has been observed that the price of local vegetable item remains more or less the same but it is only seasonal. The summer vegetables are replaced by winter vegetables depending on the season.

There is no continuity in the supply of vegetables but one thing that can be observed is that the price of the items remains almost the same and the seasonal vegetable crops are quite sufficient to cater to the demand in the market. Therefore it can be concluded that other vegetable item sold in the non local vegetable shops

specially crops like potato, tomato, onion, chilli etc., should also be cultivated by the local farmers on a commercial scale by identifying potential areas. This will ultimately reduce the dependence on the products brought from outside the State and the market can also sustain on local produce.

Taking into consideration the various environmental effects of shifting cultivation and the subsistence nature of production the local farmers should be encouraged to take up permanent cultivation. It has been observed that in some villages the farmers have started to cultivate cash crops like tomato, cabbage, cucumber, Anishi (a food item prepared from the leaves of colocasia), ginger, turmeric, etc., which has proved successful but due to lack of proper marketing and storage facilities the farmers are facing problems. They are unable to sell the produce on time therefore it gets wasted and even if the produce are sold they get minimal amount as there is no marketing channel and regulations to control the exploitation by the traders.

Since the cultivation is only seasonal, continuous supply of the vegetable items are also not possible. Squash which grows very well in almost all part of the higher altitude of Mokokchung are sold for 4-5 rupees per kg to the non local traders during the peak season and during the off seasons it is sold for 35-40 rupees per kg in the market. This indicates that due to lack of proper cold storage facilities people from outside are taking advantage by taking the produce from the district. Various other horticultural crops are cultivated in the lower and middle ranges of the district like orange, pineapple, litchi, banana etc., at large quantity but there is not a single fruit processing unit in the district therefore traders from the plains fixes the price

and takes it and the farmers have no other option but to sell the produce at those price as there is no proper market for them. For the small farmers the usual market is along some important junction on the roadside as the produce cannot be taken to the urban centres due to distance problem.

Other than the vegetable and fruits there are many other items like tea, rubber, cardamom, turmeric, Alpina, betel nut, betel leave vines, passion fruit etc., which grows very well in the district. Therefore the various departments like Agriculture, Horticulture, Land Resources, Rural Development, Soil and Water Conservation, Forest and Environment, Irrigation, Industries , PWD (R&B) Highways etc., should tie up and make a strategic and concrete plan for the development of this resources. Most importantly the Agricultural Produce Marketing Committee (APMC) should be structured with proper regulation so that the farmers at the grass root level gets the benefit without being exploited by the traders and also enjoy the fruit of their labour. It should be equipped with modern state of the art technology for storage, grading, value addition, processing, packaging and marketing so that the produce can be sold not just within the district but it can be sent to the markets in other part of the district as well as to the other States and abroad.

As far as possible organic farming should be encouraged which has high demand in the international market. The involvement of the village councils in all the developmental activities are a pre requisite for successful implementation therefore they also need to be consulted because land which is the most important resource belongs to the individual and the village council as is the case of Nagaland and that of Mokokchung district.

It has been observed that the produce marketed by the farmers includes mostly vegetables and forest products which are all seasonal and the vegetable items like those of potato, tomato, onion, chilli that are brought from outside the state can also be cultivated in the district. Rice, the staple food for the people are also brought from outside because the production in the district is not at all sufficient even for the farmers. Therefore there is an urgent need for the people of the district and the concerned departments to modulate a common strategy. At present all the departments are separately working out plans and execute according to the demands and needs of the people for the development of the district, but by implementing a coordinated strategy more success can be achieved. With consent from all the concerned departments the potential area for specific crops need to be identified in all part of the district and seeds suitable only to those areas should be distributed so that the farmers can concentrate on those crops which can give more yields. Irrigation to the fields wherever feasible should be planned out and provided. Machineries and implements that are required for cultivation especially for the paddy field in the valley areas should be provided to the farmers. This will demand good transport network for easy access to the farm and transportation of the produce which will again need to be processed. Therefore various processing unit like mills, fruit canning etc., have to be set up. And finally a good marketing system, where all facilities are available for the items to be stored, marketed and maintain a constant flow of commodity to the market should be established.

Study on the transport network of the district has revealed that roads are the only means of transportation due to the difficult terrain condition. The two important

roads connecting the district with Assam are National Highway (NH)-2 which connects with Amguri on the extreme north western corner and the State Highway (SH)-6 (now NH-702D) connecting with Mariani towards the south western part. These two roads are the main artery for the transportation of goods and services for the people of the district. It was also observed from the analysis that the important roadside locations are used for marketing of the agricultural produce by many of the villages that are located away from the urban centres as they are unable to bring the produce to market place due to distance problem.

Out of the three locations selected for the purpose of study, two of the areas i.e., Changki junction and Changtongya Town are located more or less half way of the route connecting Mokokchung town the district headquarter with the nearest railway, airport and market at Assam i.e., Mariani and Amguri respectively. The two locations are used as a stopover for traveller passing on these roads and it act as a transaction point for many of the nearby villages which gradually started to grow resulting in the development of those market centres. The farmers of the area brought their surplus agricultural produce from the field as well as forest products and sell it. Many other permanent and temporary marketing centres have been observed all along the State highways-6 (now NH-702D) like those at Sabangya, Satier, New Camp, Longnak etc., and at National Highway -2 like those at Impur Junction, Yisemyong, Chuchuyimlang and Tuli which indicates a positive impact of the road network on the development of marketing centres in the district of Mokokchung.

The availability of certain local items have also attracted people to buy those products. In Changki junction the items that are found in abundance are the lilem

leaves (M), jorang (M) and ongjang (fermented crab pickle). Another important item found at this junction is the earthen pottery for which the Changki villagers are well known. At Changtongya town along with the vegetable produce the important items are mostly of horticultural crops like orange, litchi, banana, pineapple and banana chips. The third marketing centres located at the main Town of the district headquarter stretches from Salangtam market to Kichutzar complex over half a kilometre which is well connected by roads. The variety and quantity of agricultural produce are the maximum in this centre. Almost all the items that are available at these markets can be produced in every village but some items that are grown in certain village are favoured by many as the case of zanthoxylum leaves from Longjang village, Anishi from Sungratsu village, chilli and cucumber from Khensa village, orange from Yajang village, pineapple and banana from Changtongya village.

Conclusions

The present traditional system of cultivation needs to be replaced by commercial crops with more scientific input and proper strategic planning so that the market can be dominated by the produce from the district. It will also require the construction of cold storage with 24x7 electricity so that the items can be stored and marketed during the off season and ultimately the dependence on other states will be minimised. To make this a reality a co-ordinated effort between the policy makers and the local citizen is very essential. At the outset the farmers needs to be sensitised about the various issues pertaining to the practice of the age old method of

cultivation; though certain factors like their association with this system which have been entrenched into the social fabric may be difficult to do away with but still then better method can always be encouraged. In lieu of this method since majority of the villages are located on the hill top and large scale farming may not be possible due to the hilly topography and the existence of the peculiar land holding system, the village council can decide to set aside certain areas as reserved forest in all the villages which may include among others the hill top or important watershed areas so that the surface run off during the monsoon season can be checked and retained, which will serve as a source of water for the entire village for drinking as well as irrigation in the lower areas. The protection of forest will also contribute to the conservation of many flora and fauna. The low lying areas if at all available should be kept aside for permanent cultivation where some selected crops can be raised. In Longkhum village some farmers have started to take up tomato, potato and cabbage cultivation which have proved very successful but till today due to lack of proper facilities the farmers are unable to sustain their produce throughout the year. It is only during the growing season that they can cultivate after which they have to depend on the produce that are brought from outside the state at much higher rate all throughout the off season.

Cultivation of off season crops will be very costly. Many of the farmers will not be able to afford as it will require expensive inputs. The best option is to provide good storage facilities so that the crops cultivated during the season can be collected from the farmers. This will ultimately encourage them to produce more since they

can sell their produce and the supply to the market will also be sustained with those stocks throughout the lean season.

To implement this successfully, Agricultural Produce Marketing Committee (APMC) in the district can play a very important role by adopting rules and regulations acceptable by the farming community and also identifying certain crops that can be raised conveniently without much effort depending on the location and climatic factors. Agricultural Produce Marketing Committee (APMC) should be equipped with the modern facilities along with proper managerial skill and development. Since rice is the staple food of the people of the district intensive method of rice cultivation can be taken up in the valley areas of Tsurang, Changki, Tuli, Longsa, Mangmetong, Kinunger, Aliba, Chungtia where selected seeds suited to those location should be cultivated. Other important crops that needs to be encouraged on a commercial scale includes tomato, potato, chilli, onion as these are the major vegetable items required by the people.

The forest products that grows in abundance and having high medicinal values like those of balliric myrobalan, Indian gooseberry etc., horticultural and plantation crops that grows well in the district needs to be taken up in a large scale which can be processed and sent to outside market to generate more income for the local people. This requires a well established market system. Marketing and handling of the produce is an important area that requires special attention which is lacking at present. This discourages the farmers as they are unable to sell their produce and get the benefits from the effort they put in for the whole year. The improved productivity and value addition to the agricultural produce will go a long way in the reduction of

import from outside, while it will lead to the development of the overall economy through the linkage of agricultural and non agricultural sectors thereby maintaining an equitable development in all parts of the district.

In the mean time the improvement in production can lead to food security and reverse the present trend of importing huge quantity of items by exporting the produce to the outside market. In the quest for all such development the basic ethics of conserving the environment and adapting to organic farming should be taken into consideration for a sustainable future.

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