CHAPTER III

GEOGRAPHICAL SETTING

Nagaland tapering towards north and with its narrow end at the south-west is one of the easternmost States of Indian Union, with an area of 16,579 sq.km. It is the third smallest State in the country, first and second being Sikkim and Tripura respectively. The State lies between 25°6' N and 27°4' N latitudes and between 93°20' E and 95°15' E longitudes. While it is bordered on the west by Assam, on the north-east and the south by Arunachal Pradesh and Manipur respectively, it is bordered by Burma on the east, thus making the State strategically significant (Fig. 1). Further, it is almost equidistant from the tri-junctions of Indo-China-Burma in the north-east and Indo-Burma-Bangladesh in the south.

3.1 Geological Structure:

Geologically, Nagaland which constitutes the northern part of the Indo-Burma ranges, is bounded on the western side by the Pre-cambrian Mikir Hills massif and Tertiary shelf sediments of Assam Plains and on the
north-west by Brahmaputra Plains through lineaments. On the eastern side lies the western Central Low Lands of Burma containing a gigantic thickness of Cenozoic sediments. To the north the State runs into the so called 'eastern syntaxial bend' of the Himalayas and southward it passes into the hills of Manipur and Cachar (Assam) enclosing Tertiary sediments. Southeastward, these hills can be located through Chin Hills and Arakan Yomas (Burma) into Andaman-Nicobar Island in the Bay of Bengal. Further south-east these can be linked up with the chain of islands off the Sumatra coast in the Indian Ocean.

The hills of Nagaland being created in the Tethyan orogenic belt form a part of the Alpine-Himalaya mountain chains. These are built up mostly by the thick sequence of Cenozoic and late Mesozoic sediments. These sediments are bounded on the eastern side by an ophiolite complex and shelf sediments along the eastern periphery of the State bordering Burma. In the western part of the State, the most prominent morphotectonic sedimentary crustal block is the 'Belt of Schuppen'.

The general rock sequence in the State can be tentatively grouped into:

1. The Nimi Formation of Palaeozoic Age

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1 Status of Geological work and Inventory of Mineral Discoveries in Nagaland, Directorate of Geology and Mining, Dimapur, 1978, p. 3.
2. The Ophiolite Complex of Upper Cretaceous.
3. The Disang Group of Lower and Middle Oligocene Age
4. The Barail Group of Eocene and Oligocene Age
5. The Surma Group
6. The Tipam Group
7. The Namsang Beds of Mio-Pliocene Age
8. The Diiming Group of Pliocene-Pleistocene Age.

The 'Nimi Formation' which covers the eastern fringe of Nagaland extends from Mollen in the south to Saramati Peak in the north for about 30 km. in length.² It is thrust over the Ophiolite Complex from the east and consists of crystalline limestone, quartzite, phyllite, etc. The largest limestone deposit of the State is found in this formation. The Ophiolite Complex which also occurs in the eastern part of Nagaland is tectonically sandwiched between the 'Nimi Formation' in the eastern side and the 'Disang Formation' in the western side. Minerals, such as magnetite, nickel, chromium, cobalt, copper, zinc, etc., mostly occur in the land characterised by Ophiolite Complex of the State.

The Disang Group of rocks comprising a very thick sequence of flysch sediments occur in the intermediate hill regions covering nearly half of the surface area of the State. This Disang Group gradually merges with the overlying Barail Group of rocks which are predominantly mollasic sediments.

² ibid., p. 3.
The Barails are mainly confined to the 'Belt of Schuppen' in the outer hill areas and also crop out as outliers over Disangs in some high ridges in the intermediate hill areas. The main rock types found in the Barail Group are well-bedded sandstone, shale, clay and coal. The Barail rocks are followed by an unconformity over which Miocene Surma Group of rocks are deposited. The Surmas are exclusively confined to the 'Belt of Schuppen' and are also molassic sediments of sandstone, shale and clay. The Tipam Group of rocks which conformably overlie the Surmas are mainly confined to the 'Belt of Schuppen', though they also occur sporadically in the eastern high hill areas where they unconformably overlie the Disangs.

The Namsang Beds are found overlying the Tipam Group of rocks in the western part of Nagaland and are absent in the intermediate and eastern hill ranges. The rocks of Namsang Beds consist of a poorly consolidated litho-sequence comprising conglomerate, grits, mottled clays and sandstones. The Dihing Group, on the other hand, resting over the Namsang Beds with a minor unconformity is found in a few places only in the outer hill areas of the State. Gravels, thin clays and sands are the main constituents of the Dihing Group.

The eastern part of the State seems to be more endowed with mineral resources, though full exploration is yet to be done. The 'Nimi Formation' in the eastern fringe
conceives the largest limestone deposit of the State. The associated sheared granites, schists and quartzites found in the 'Formation' hold prospect for tin, copper, gold, etc. The ophiolite belt also provides diverse mineral presence represented by podiform chromite, magnetite, nickel, cobalt, base metal, asbestos, brucite, etc. The Disang sediments spread over a vast country of intermediate hill ranges too exhibit occurrences of limestone, brine springs, slates, black shales and pyrites. The Barail Group of rocks occurring mostly in the 'Belt of Schuppen' is rich in coal. The important coal belts such as Borjan and Tiru-Valley of the State are confined to the Barail rocks only. The Tipam and Surma Groups of rocks also hold promise for yielding glass sands, clays, iron laterites and building materials.

3.2 Physiography:

Topography of Nagaland is similar to that of any other young mountain terrain, featured with high hills, sharp crest ridges, deep gorges and narrow valleys. Barring a few hundred square kilometres of plains along the foothills in the western part of the State and in the valleys along the river beds, the entire State is covered with high hill ranges (Fig. 2). Orographically, the terrain of the State can be subdivided into three NE-SW trending longitudinal segments, viz. (i) high hill ranges in the east, (ii) medium high hill ranges in the intermediate zone and (iii) outer foothills areas in the west. The altitude of this
FIG. 2

NAGALAND PHYSIOGRAPHY

SOURCE: BASED ON CENSUS OF INDIA, 1971
characteristically nilly State varies between 110 metres and 3,640 metres above mean sea level.

The outer foothills areas which rise from the plains of Assam in the western portion of the State are of the lowest elevation of the three segments mentioned above. Here the altitude ranges from 110 metres to 600 metres. On the extreme western part bordering Assam the areas are dotted with a few plain expanses. The most important one is the plain of Dimapur where the town of Dimapur itself is located. This plain starts from Chumukedima and after covering a surface area of about 150 sq.kms. within the State merges with the plains of Sibsagar District of Assam. This plain falls under Kohima District. Another plain with a surface area of about 50 sq.kms. is found around Naginimara in the mid-west of the State. It commences from the foothills at Kongon Village (Mon District) and stretches up to the lower course of Dikhu River. The third important plain skirting Tizit (Mon District) is in the north-western side of the State. It has a total surface area of about 75 sq.kms.

Nagaland being formed of young hills, is devoid of any plateau or tableland like the adjacent areas of Arunachal Pradesh and Burma. However, in the outlying hill tract, on the western side of the State there are a number of valleys.

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located at an average altitude of 300 metres. These are:
(i) Ghaspani Valley, (ii) Bhandari Valley, (iii) Merapani
Valley, (iv) Tsurang Valley, (v) Lakhuni Valley and
(vi) Tiru Valley. The first one is situated in the south-
western part of the State and is in Kohima District, while
Bhandari Valley and Merapani Valley are located in the mid-
west of the State and are situated in Wokha District. On
the north of Merapani Valley lie the valleys of Lakhuni and
Tsurang which join the plains of Assam. These two valleys
are in Mokokchung District. The northernmost of the
valleys is Tiru, commonly known as Tirupathar. It is
covered by thick forests and is in Mon District. All these
valleys are suitable for cultivation.

On the east of the outer foothills is the intermediate
zone which is characterised by a continuous hilly range with
altitude between 600 metres and 1,200 metres. These medium
hill ranges run through the middle of the State from north-
east to south-west like a spinal column. From here the
hills gradually rise in altitude to turn to high hill ranges
which spread farther to the east of the State. The high hill
ranges, unlike the medium ones in the intermediate zone do
not maintain a continuous range. The hills are marked by
serrated ridges and are separated from one another by deep
valleys. This part of Nagaland dominated by rugged terrain
and lofty hills remains clothed for the most part of the year
with dense forest, scrub and grassland. Their altitude
varies from 1,200 metres to 2,400 metres and above, and it
is generally higher in the extreme eastern portion of the State bordering Burma.

Patkai Range, the highest mountain range of the State attaining a height of 3,840 metres at Saramati traverses the extreme eastern high hill ranges. It takes a north-south course separating the State of Nagaland from Burma and also acts as a watershed between the rivers of India and Burma. Tizu is the only major river of Nagaland that crosses this range and empties itself on the eastern side in the Chindwin Drainage System of Burma. The western side of the Patkai Range falls in India.

The Barail Range is another important mountain range in the State. It enters the State from North Cachar and after passing through Kohima area runs towards Wokha (north of Kohima). Japvo, which is located a few kilometres south of Kohima, is the highest peak of Barail Range. It attains a height of 3,014 metres above mean sea level. Here the range is met by a complex hilly range prolonged from the Arakan Yoma (the dominant mountain system of Burma), and from this point the main range runs in a north and north-easterly direction. The Barail Range is connected with the Patkai Range through small ranges. One of these ranges connects them in the vicinity of Kohima. Up to Mao (Manipur) it runs in a south-east direction and from there the range assumes an eastward trend and runs for a few kilometres until it follows a southward direction. It reaches Ukhrul
(Tangkhul-Naga area in Manipur) and continues thereafter in an eastern direction. The second linking range also takes a zigzag course. It joins the first range at Mao and crosses the Patkai Range in the east of Tuensang. Like the main hill ranges of Nagaland these two linking ranges spread out many ridges, spurs and small branches. However, as they remain clothed with dense forests, do not appear otherwise as distinct relief features. In fact, the appearance of so many mountainous features makes the relief of the State quite complicated and confused.

The hilly nature characterised by rugged terrain and lofty ranges has a great bearing on the population distribution and the human landscape of Nagaland. Definitely, it is the extreme eastern part bordering Burma which is less developed and accessible mainly because of the constraints imposed by the comparatively formidable physical terrain. The intervening valleys in the State are generally deep and narrow. In the majority of cases, the valleys are gorgeous in nature.

3.3 Drainage System:

Nagaland is dissected by a number of seasonal and perennial rivers and rivulets with V-shaped valleys in between. Most of the rivers remain dry in winter but roar and murmur as they glide down the green hills during summer, mostly to join the mighty Brahmaputra in Assam.
Ditchu, Dhansiri and Tizu are the major river systems which are of dendritic nature (fig. 3). Of the rivers, Dhansiri, Doyang and Dikhu run towards west and flow into the Brahmaputra. The Tizu river system on the other hand, flows towards east and finally enters the Chindwin River in Burma.

Doyang: It is the longest river in the State originating from the Japvo Hill near the northern slope of Mao in Manipur. First, it flows in a north-easterly course for about 75 kms. Thereafter, it turns suddenly to north-west at right angle and traverses in a south-west direction, thus taking the form of a rectangular drainage pattern. The river drains the inhabited areas of different tribal groups, sometimes providing itself as a boundary for different tribal territories. In the south it passes through the Angami territory and flows towards the eastern edge of the Hengma territory. Moving northward it enters the Sema area in the Monheboto District and then flows through the Lotna territory in Wokha District. It drains a great part of Wokha District and after flowing towards south-west of the district leaves the hills and finally falls into Dhansiri in Sibsagar District of Assam. Doyang is joined by many hill streams in its central and western parts. Chubi, which flows southward from Mokokchung District and empties itself in Doyang, is a supplementary system of the Doyang. Another tributary of Doyang is Nzhu. It originates from the Nerhema area in the Kohima District and after flowing through Miphong in the
Rengma area pours into Uoyang in Wokha District.

Dikhu: It is another important river that originates from the central part (near the Nuroto Hill in Sema area) of the State. The river traverses towards north along the border of two adjoining districts, namely Mokokchung and Tuensang. The tribal territories of Ao (Mokokchung District), Phom and Konyak (Tuensang District) are drained by this river. Towards the north, it is joined by its main affluent Yangyu which is an important river in the territories of Phoms and Konyaks. From the confluence, Dikhu flows further to the north and wending its way in the hills of Konyak area, finally takes leave of the hills near Naginimara. It merges with the Brahmaputra River in the plains of Assam. Its total length within the State is about 160 kms.

Dhansiri: Dhansiri, which flows in the southwestern part of the State, rises in the south-west of Kohima District. It runs westwardly until it assumes a northwardly course forming a natural boundary with North Cachar Hills at the extreme south-west of the State. Having debouched from North Cachar, it takes an eastward direction and flows through the Rangapahar-Limapur Plains in Kohima District. Again leaving the district it runs northward until it falls into the Brahmaputra. This river receives almost all the western and southern drainages of Nagaland.

Tizu: The Tizu River which forms an important drainage
system in the eastern part of the State, assumes a special significance as it exposes the Ophiolite Complex of Nagaland in its deep gorge sections and provides vital geological data. It originates from the central part of the State and runs in a north-east direction. Then it bends and assumes a southeasterly course. At last, the river leaves the State and exhausts itself in the Chindwin river. Zunki is an important tributary of Tizu River. It starts from the extreme eastern corner of Tuensang district and flows southward mostly draining the Kheinmungan territory. The river joins Tizu River in the south.

Milak is another important river that flows through the Ao area. Its source is found in the heart of Mokokchung Town. Among the Aos through whose land alone it flows, it is known as Milak. However, the continuity of it in Assam is known as Jhanji. The notable tributary of Milak River is Tsurang. It rises east of Lakhuni Village (Wokha District) and then flows between Yachang and Lirmen villages (Mokokchung District) on the one side, and Molung Village (Mokokchung District) on the other. Besides these rivers, there are a large number of rainfed rivulets, the beds of which remain almost dry during the dry season.

Lakes and waterfalls: The important natural lakes in the State are: (i) Omoklushi and (ii) Yimyu Awatsung. Omoklushi is situated in the outskirt of Chuchuyimlang Village.
This lake is a beauty spot near the town of Mokokchung. The second one is situated near Mopongchukit Village (Mokokchung District). Both the lakes are about 1,300 metres above sea level and have sparse aquatic vegetation. There are no permanent waterfalls in the State, but several occur during the monsoon, although not of much importance.

The role of river basins in shaping the human landscape in the State can hardly be ruled out. It is usually these rivers which form the natural territorial boundary of different tribal groups in the State. This can be easily seen in the case of Boyang which acts as a demarcating line of the territorial boundaries of several tribal groups such as Hengmas, Angamis, Lothas and Aos. Dikhu also forms a traditional boundary between the Ao, on the one hand, and the Sangtam, the Phom and Konyak, on the other. Similarly, other rivers such as Tizu and Dhansiri do play the role of demarcating the traditional territories of different tribal groups. Thus can be said that the river basins coupled with physiographic conditions have performed the role of natural ecosystems where the separate tribal groups have settled and have acquired definite and distinct characteristics. Further, they have influenced to a great extent the siting of settlements, the orientation of lines of communication and the extent of cultivation.
3.4 Climate:

In general the climate of Nagaland is healthy and bracing. However, it shows spatial variations. While it is warm sub-tropical in the western low-lying areas and in the foothills, in the mid-slopes and lower ranges of the western flank it is moderate submontane. Usually, cool and temperate climate prevails in the eastern part of the State where the difference between summer and winter temperature varies from 5°C to 25°C. Winters are very cold over the hills and there is often occurrence of snow over large tracts of land. However, the cases of the incidence of snowfall in the inhabited areas are rare. Over the foothills the range of summer and winter temperature is between 12°C and 32°C. The average annual rainfall for about 7 months from May to October is between 200 cm and 250 cm in the State. Among the various recording centres (Table 3.1), the highest annual rainfall, i.e., 305.0 mm is recorded in Wokha which is located in the central part of the State (Fig. 4). It is followed by Mon which has 243.5 mm annual mean rainfall. The lowest has been recorded in Kiphire (105.5 mm) which is situated in the eastern part of the State. There the total number of rainy days is 145, whereas the intensity only 97.1 mm.

As elsewhere the climate of Nagaland exhibits a seasonal rhythm with four characteristic seasons. These are: (i) Winter (December to February), (ii) Pre-Monsoon (March to
Table 3.1
Rainfall and Its Intensity at Different Centres in Nagaland, 1982

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<td>251.5</td>
<td>17</td>
<td>14.7</td>
<td>430.0</td>
<td>23</td>
<td>18.7</td>
</tr>
<tr>
<td>October</td>
<td></td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<tr>
<td>November</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>December</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>3,693.7</td>
<td>149</td>
<td>196.1</td>
<td>2,671.0</td>
<td>143</td>
<td>156.3</td>
</tr>
<tr>
<td>Annual Mean</td>
<td>305.6</td>
<td>12.4</td>
<td>16.3</td>
<td>222.5</td>
<td>11.9</td>
<td>13.0</td>
</tr>
</tbody>
</table>


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April), (iii) Monsoon (May to September) and (iv) retreating Monsoon (October to November). However, the analysis of climate reveals that practically the two seasons—winter and rainy—dominate the year in the State. Spring and Autumn are generally shortlived.

Winter season usually commences from the month of December with a steep fall in temperature. With the temperature fall, it becomes very cold and this continues to be so till the first week of February. During this period a cold wind blows from the high range of Saramati which lies in the east of the State. This wind gets mixed up with North-East Monsoon and it brings cold particularly to the eastern side of the State. January is the coldest month all over the State with an average temperature varying between 10.4°C and 17.06°C. The average rainfall is very low and the winds that blow are generally invariable. During this period frost falls in places like Aghunato, Kunheboto, Phek, Nokha, Pfutsero, etc. With a gradual rise in temperature the Pre-Monsoon period starts generally from the first week of March. It is characterised by strong winds, sometimes accompanied by thunderstorms. Very often strong winds and thunderstorms are preceded by dust-raising squalls. During this period the sky usually remains clear almost throughout the day. The strong wind which blows from south-west at times rises up to 100 kilometres per hour in velocity. It blows almost throughout the day beginning from noon and ending at midnight.
or early in the morning. It often causes damage to the tin-roofed buildings.

The monsoon period is the longest season of the year. The temperature which begins to rise from the first week of March attains its climax at this period. The hottest month is July when the temperature rises up to $25^\circ C$. It is also the period of heaviest rainfall, the greatest concentration being in July and August. During this rainy season the average relative humidity is 85 per cent but at times it goes up to 90 per cent and 95 per cent and as such it is rather damp during monsoon. The monsoon period is followed by the retreating monsoon which usually begins from the month of October and ends in November. During this period there is a marked decrease in the amount of rainfall as well as in temperature. However, whenever there is depression in the Bay of Bengal, Nagaland gets drizzling and rainfall. Sometimes the intensity of rainfall is greater than that in the Gangetic West Bengal. The retreating monsoon could be mentioned as the best period when the weather is generally cloudless and pleasant all over the State.

3.5 Soils and Vegetation:

Except in the valleys and along the foothills with comparatively level land and gentle gradient, the soil cover in Nagaland is thin. Because of torrential rain over the hills, rapid erosion of soil cover occurs in the hills. The
inherent problem of soil erosion is further aggravated by extensive practice of jhum cultivation in the State. This ultimately leads to the deposition of materials in the valleys and in the low lying areas.

Soils of Nagaland derived from tertiary rocks belonging to Barail and Disang Series are generally acidic, rich in organic carbon but poor in phosphate and potash content. Due to variation in topography and climate, different kinds of soils occur in the State (Fig. 5). Soils can be broadly grouped into: (i) Alluvial soils and (ii) residual soils. Under the former are included (a) recent alluvium (Entisol), (b) old alluvium (Oxizols and Ultisol) and (c) mountain valley soil (Entisol). Recent alluvium which is technically known as Antisol occurs mostly in the western and southwestern part of the State, whereas old alluvium is chiefly found in the northwestern part of Nagaland bordering on the Sibsagar District of Assam. Mountain valley soil (Entisol) on the other hand, mostly occurs in the valley in the central and eastern part of the State. Antisol with its pH 4.4 - 4.6 content covers about 224.8 km² of the total land surface of the State. Though alluvial soils are more fertile, such formations are diminutive in the State mostly confined to the low lying areas in the west and to the banks of the rivers.

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Residual soils which are generally porous and have light texture and friable structure dominate much of the landscape of Nagaland. The important sub-groups of residual soils that occur in the State are: (a) laterite soils (Oxizols and Ultisol), (b) brown forest soils (Mollisols and Inceptisols) and (c) podzolic soils (Spodosols). Laterite soil (Oxizol) is the most widespread type of soils which is found all along the State in between ultisol and mollisol. It also occurs in mid-southern part as well as in the eastern part of the State. It has pH 4.2 - 4.5 and occupies about 4495.8 km$^2$ of the total area of the State. Brown forest soil (Mollisol) is, on the other hand, found mainly in the intermediate high hills ranges. Its pH content ranges from 5.3 to 5.6 and its total coverage of surface area is around 4952.7 km$^2$ of the total area of the State. Podzolic soil technically known as Spodosol occurs over high altitude with humid and temperate climate in the central, southern and eastern part of the state. Major part of the Tuensang district is occupied by this type of soil. Spodosol with pH 5.4 - 6.0 covers about 4835.0 km$^2$ of the total land surface of Nagaland.

The variations in altitude, climatic conditions and soils have a stimulating effect on the luxuriant growth of a wide variety of vegetation in Nagaland. In the State five forest types can be located (Fig.6). These are: (a) subtropical moist deciduous forest including bamboo,
(b) Sub-tropical evergreen rain forest, (c) Temperate evergreen highland forest, (d) Coniferous forest and (e) Degraded growth (on jhumland). Sub-tropical moist deciduous forest including bamboo is mainly found in the western part all along the Assam border where the altitude is lower than the rest of the State. The sub-tropical evergreen forest, on the other hand is chiefly concentrated in the northwestern part around Tizit area (Mon District). Here the important species of trees are: Hilika (Terminalia myriocarpa), Hingori (Castonopsis indica), Koliori (Cyclastemon assamicus), Moj (Albizzia lucida), etc. The temperate evergreen highland forests which have dense floor cover dominated by shrubs and herbs are mostly found in the eastern part along the International boundary. It is also found in a narrow strip of land running from north to south in the middle portion of the State. This type of forest is rich in commercially significant tree species, such as Champa (Michilia champaca), Amaric (Amoora wallichii), Simul (Bombax ceiba), Hollock (Terminalia myriocarpa), etc. Coniferous forest, on the other hand, is found mainly in the areas of colder and higher altitude in the southeastern part of the State. Degraded regrowth (on jhumland) is the most widespread and it covers about 40 per cent of the total land surface of the State. Besides these forests, there is a number of reserved forests, namely Intanki, Nangapar and Singpho. Intanki and Nangapar are located in the extreme
southwestern part of the State facing the plains of Assam. They fall under Kohima District. Singpho, on the other hand, is situated in the northwestern part and it falls under Mon District.

The impact of physiography, climatic and vegetative conditions on the social surface and extent of interaction process is greatly felt in the State of Nagaland. This can be seen in the light of the extent of accessibility to different parts of the State. From the accessibility point of view, the State can be broadly divided into three in tune with the three physiographic segments. These are: (i) easily accessible area (ii) less easily accessible area and (iii) least accessible area. Naturally, the western part of the State facing Assam where the lie of the land is characterised by comparatively low altitude is the easily accessible area. Here the terrain does not pose much a problem to the movement of people from one place to another and to the implementation of developmental programmes. Compared to other parts of Nagaland, this western part has a good network of communication and the inhabited areas are well-nigh connected at least by jeepable roads. The intermediate segment or the central part of the State with more rugged terrain than the western part, can be categorised as less accessible. Development process and the movement of people in this part are to a great extent restricted by the lack of good means of communication. Compared to the western
part, it is still backward both socially and economically. Least accessible and hence the most isolated part is the eastern high hill region bordering Burma. The physical compulsion in some interior areas is such that even the development of jeepable roads is far from feasible. Concomitantly, people in the extreme corner have less opportunity to expose themselves to the outside world. In many areas people still live confined to their own traditional social milieu manifesting a primitive type of society. People belonging to tribal groups such as Kheinmungan, Konyak, Tikhir, Chirr etc. inhabit the easternmost portion of the State.

3.6 Economic Setting:

Like most tribal areas, Nagaland is overwhelmingly an agrarian region. Whatever industries have come up in recent years are very few in number and small in size. Participation of workers in different economic activities is increasing over the years, but agriculture still absorbs about 73 per cent of the total main workers.

3.6.1 Agriculture: Until 1950 about 95 per cent of the population in Nagaland was directly dependent upon agriculture. But now with the opening of other means of living, such as Government Services, business, contract works, etc. the percentage of people dependent on agriculture has declined to around 80. The State being hilly, shifting
cultivation has been the order of agricultural setting since time immemorial. Terraced cultivation, though prevails is not widespread and is practised only by a certain tribal groups like Angami, Chakhesang and Zeliang. Besides, wet rice cultivation has also made appearances in a number of areas particularly in the western low lying areas of the State. A detailed discussion on each of the types of cultivation will be done later.

3.6.2 Horticulture: Horticulture, though good both from the perspective of commercial purpose and the conservation of soil, is not widely practised in the State. People are being encouraged by the Government in view of the suitability of climate, the incline of the areas mostly with more than 45° slope from the valleys and the great potential for the development of almost all kinds of fruits, vegetables, cash crops, coffee, tea and aromatic plants. At present, there are about 20 Government run-nurseries for orchards which are mostly located in the western part of the State. However, despite the impetus given by the government, people still seem unaware of the utility and economic viability of this productive fruit farming. So far, only some people have taken to fruit farming in the context of soil conservation as well as supplementation of their income.

3.6.3 Animal Husbandry: Apart from land, the animals in no small measures add to the stock of wealth for the Nagas. Mithun, the bison - like wild animal which is usually domesticated on a ranch system is an excellent source of beef and
is used for paying oride price. Nagas are also used to rearing pigs and poultry in a traditional way. An average Naga family owns two to four pigs and are reared in the front portion of the house. Cattle are also widely reared; they are mostly small in stature and light in weight. Resultantly, these cattle do not yield rich beef. In order to replace the indigenous cattle by better breeds, steps are being taken now at the instance of the State Government. Besides, facilities are being extended to the people to domesticate sheep and goats which are otherwise rarely seen in Nagaland.

3.6.4 Fishery: Of late, the development of fisheries is making its impact on the economic landscape of Nagaland. In the field of pisiculture the State possesses 10 fish farms, 6 fish culture units, four induced breeding units. Almost all the fish farms are located in the vicinity of Dimapur besides, around 200 tanks are there in the neighbourhood of Dimapur which are growing to be potentially very good centres for protein rich food fish. A scheme of constructing and maintaining fish tanks in all the villages of Nagaland is afoot. The paddy-cum-fish culture programme is being propagated among the paddy cultivators by way of distributing free fingerlings. The impact of the programme is seen particularly in the Angami and Chakhesang areas where terraced cultivation is in vogue. They rear fish not only for their own consumption but also for commercial purposes so as to supplement their income.
3.7 Mineral Resources:

Though Nagaland is said to be endowed with mineral resources, no proper exploitation has been done so far particularly in the eastern sector of the State. In respect of coal which is of economic significance, Nazira coal field and its southwesterly extension appears to be important. In this field coal is mined at Borjan in the Saffrai area. The coal obtained from the area is consumed in the tea gardens and brick lins in the neighbouring areas of Assam and also by the railways. Coal also occurs at Jhanji and the Desai Valley, 13 and 32 kilometres south-west of Nazira field. In Desai Valley the coal seams are located in the vicinity of the settlements of Lirmen, Aonokpu, Merinokpu and Lakhuni. All are within Mokokchung District and fall under Ao territory.

Detailed geological investigations for limestone, nickel-cobalt-chromium bearing magnetite, and clay deposits have been carried out in the eastern portion of the State. Marble occurs near Burma border in Tuensang District, so also limestone around Nimi (Tuensang District) and Wazeho (Phek District). Magnetite deposits (containing metal, chromite etc.) have been located in Pokphur tract (Tuensang District) and in the eastern part of Phek District. Tuffaceous material also occurs along some of the stream courses as encrustations on the exposed rocks and boulders.
It occurs though small in quantity in the areas surrounding the villages of Kezoma, Thenizuma and Kekrima (Kohima District). Besides, building materials such as sandstones, slates, stream gravel and boulders are found in large quantities in Nagaland. Sandstone is found and mined near Kohima, Mokokchung and Wokha. Slate of good quality occurs and is mined in Tuensang District where it is popularly used for roofing purposes. Besides, salt is produced from the brine water obtained in some of the village wells located in the villages of Yisi, Purr, Molen, Ozeho (Kohima District) and Longzang, near Lungwa outpost in Mon District. The salt obtained in the villages of Yisi and Longzang is white, whereas that of other areas is a bit brown. However, with the development of road and communication system in Nagaland, the practice of procuring salt from brine water is fast dying out as cheaper salt is now available everywhere in Nagaland.

3.6 Industry:

Nagaland is still in its infancy in the field of industry. Lack of raw materials, power, market, transport, technical persons as well as labour are some of the hurdles that act as bottlenecks for the industrialization of the region. However, the State offers great potential for the development of small scale and cottage industries. At the moment there are only 4 medium sized industries in the State. They are: (i) Sugar Mill at Dimapur (ii) Plywood Factory at
Tizit, (iii) Distillery Plant at Dimapur and (iv) Paper and Pulp Mill at Tuli. A fifth industrial project, that is, a Mini Cement Plant at Waizho (Phek District) is being initiated in the State through North Eastern Council. The project is under way and expected to commission production very soon. Paper and Pulp Mill at Tuli (Mokokchung District) with a production capacity of 1000 tonnes per day is one of the biggest industrial units of its in the North Eastern Region of the country. The raw material used in this unit consists of 50 per cent bamboo and 50 per cent reed.

Although the industrial landscape of Nagaland is dotted with only a few medium sized industries, it abounds in cottage industries which are found in almost all the Naga villages. Traditionally, Nagas are used to weaving, bamboo and cane works, wood works and wood carving, blacksmithy and making of potteries. Every woman is expected to know weaving at least for the basic needs of the family, if not for commercial purposes. The most important handloom products are wrapper, shawl, handbag, necktie, loin cloth, lace for dao case, etc. Bamboo and cane works, and wood carving are a heritage handed down from the bygone days to the present generation. Baskets, conical in shape for carrying luggage, packages, paddy, etc. and parts of ornamental dress such as fillets, legging, hats, garnet, etc. which have artistic value and significance are woven of bamboo and cane. Besides wood carving on the pillars of the morungs and dwelling houses,
people make dao-case and platter with legs out of wood. There are smiths in almost every Naga village and they make agricultural tools and implements such as dao, axe, sickle, scrapers, hoe, etc. They also make spear heads, butts, and bracelets and head rings for women. In Naga villages pots are simply made with hand and stick. These are of different shapes and sizes and are used for cooking and as containers of valuable household goods.

3.9 Transport and Communication:

3.9.1 Road: Before the British brought Naga Hills to the fold of their administration there was practically no road worth the name. It was only from 1876 that a few bridle-paths connecting Kohima with Samaguting (modern Chumkedima) and Kohima with Wokha and then to Mokokchung and Mokokchung to Amguri were constructed. Bridle-paths were also constructed later to connect Mokokchung with Zunheboto. Gradually, Kohima - Samaguting road was extended up to Dimapur in the west and up to Imphal in Manipur on the south. This road was widened and metalled for motor traffic during the Second world war (1939-1945). During the same period other existing roads were widened and made jeepable through Kachcha and later Tuensang was linked with Mokokchung. After getting the boost in the roads expansion during the war, there was practically no improvement in road communication till 1957 when Naga Hills Tuensang Area or NHTA was formed as a separate administrative unit. This and the emergence of
Nagaland as a State in 1963 brought great changes and improvement to the road condition of Nagaland. New roads were constructed, while the existing ones got widened and metalled. At present all the State Highways, viz. Dimapur-Kohima (National Highway No. 39), Kohima-Zunheboto, Kohima-Pfutzero-Phek, Mon-Sonari etc. are metalled, so also most of the roads connecting different administrative headquarters.

With the formation of the Statehood of Nagaland, the Nagaland State Transport (NST) organization came into existence and buses started plying between Kohima and Dimapur from 1964. Soon after, the NST expanded its network and introduced buses on other roads. Now buses ply from Kohima to Dimapur, Kohima to Wokha, Kohima to Zunheboto, Kohima to Phek via Pfutzero and Kohima to Kiphire. There is also regular bus service from Mokokchung to Amguri, Mokokchung to Mariani, Mokokchung to Tuensang, Mokokchung to Zunheboto, Tuensang to Amguri viz Mokokchung, Tuensang to Kiphire, Mon to Sonari, Dimapur to Mokokchung viz Mariani, Dimapur to Gauhati, Dimapur to Jorhat, etc. In all these roads trucks also ply carrying goods to different places in Nagaland. Most of the roads linking the district headquarters are maintained by the Border Roads Organisation. Apart from these main roads, many roads have now come up connecting the villages with the administrative headquarters (Fig. 7). However, the road development in Nagaland cannot be said as
uniform. The western part where land is not so rough and rugged has an edge over the eastern part in this respect. Many settlements in the extreme eastern portion are without any sign of even the jeepable roads either approaching or connecting them with other places. Nevertheless, expansion and construction of roads have been going on by leaps and bounds despite the inhospitable and rugged topography of the State. The roads which pierce the breasts of the mountain and girdle their way in a serpentine curve negotiating heights and going down the valleys have naturally given a new sense of unity and purpose to the Nagas. Consequently it has shortened the social distance and has helped in the emergence of social cohesion and fellow-feeling among the people who were hitherto in their own worlds separated and isolated from one another.

3.9.2 Railways: As the topography of the region is hilly forbidding easy development of railway, Nagaland is practically deprived of railway system. The Dimapur enclave jutting into the Assam plains provides the only railway station in the whole of Nagaland. It is also the only railhead for Manipur, another outlying territory in the east. As a result, Dimapur is an important commercial centre which handles the entire import and export trade of Nagaland and Manipur. Foodgrains, cement, structural (including corrugated iron sheets and pipes), textiles, salt, machinery, etc. are the major commodities that come into Nagaland
through Dimapur. Besides its importance in commercial purposes for the people of Nagaland, many passengers from Nagaland avail the train from here. Recently, the North-East Frontier Railway (NFR) that runs from Gauhati to Dibrugarh through Dimapur has sent out a branch line from Simulguri to Naginimara. So, it can be said as the only other railway station of Nagaland. This line has been introduced primarily for carrying the coal of Borjan Colliery through Naginimara. It is of immense help for the passengers from the northwestern part of the State. Many passengers especially of Wakching area of Mon District entrain from here to get the train in the main line at Simulguri.

3.9.3 Airways: The only aerodrome in Nagaland is at Dimapur. It was constructed during the Second World War for the quick transportation of military personnel and logistics. However, after the cessation of the war it fell into neglect and remained unused for a long time. The need for it revived and was revamped with the outbreak of insurgency in 1956 for evacuating wounded soldiers by air. After Nagaland's attainment of Statehood it has been in use as a regular airport for flights from Calcutta to Dimapur via Gauhati.