CHAPTER IV

THE DISTRIBUTIONAL PATTERN

THE ROAD SYSTEM

General Distributional Pattern: The road system in Manipur is complicately laid out. A general glance at the road map of the state shows the following framework and pattern of roads (Map 20):

1) There are two or three longitudinal roads which run from north to south. These roads are (a) Imphal-Mao, (b) Imphal-Singhat via Churachandpur, and (c) Imphal-Chakpikarong via Sugnu.

2) The second type of roads are radial roads radiating from Imphal and other important centres.

3) The third type of roads are tributary roads meeting the main roads at any direction.

4) The fourth types of roads are tentacular roads (but controlled by relief) such as Imphal-Jiribam, Tipaimukh-Churachandpur, and Imphal-Moreh roads.

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Regional Pattern: The regional lay-out of the roads in Manipur is influenced by the varied topography, water features, soil and vegetation and various cultural characteristics. Therefore, the roads have developed into the following regional patterns:

1. Radial Pattern: This pattern is developed in the central part of the state. Most of the roads such as Imphal-Dimapur and Imphal-Moreh, Imphal-Jiribam, Imphal-Chakpiarong, Imphal-Ukhrul, Imphal-Churachandpur, Imphal-Yairipok, Imphal-Kangchup, and Imphal-Pukhao roads radiate from Imphal, the state capital. Several district roads also connect these roads and ultimately produce a cob-web pattern in the central part, the Manipur valley.

2. Tentacular Pattern: This pattern of road has developed in the hilly and mountainous part of the state. The Imphal-Jiribam, Churachandpur-Tipaimukh, Ukhrul-Jesami, and Ukhrul-Kasom Khullen roads are oriented by the position and direction of the mountain and hill ranges and rivers, which ultimately produce a tentacular pattern.

The road system of Manipur has evolved out of the interaction of the historical and various social
forces. The regional road pattern is the outcome of the varied physical features like landforms, water features, soil and forests etc. But landforms or relief features play the most important role in the construction and layout of the roads.

CHARACTER OF ROADS

The road system of Manipur is in most cases characterised by the varied physical features. The ascends and descends, and windings or straightness of the roads are due to the unavoidable natural and man-made barriers such as the varied relief, soils, vegetation, lakes or rivers and settled sites etc. As such, the character of roads in Manipur can be studied under two heads; (a) the alignment characteristics and (b) the surface conditions.

The Alignment characteristics

Except for a small portion of the roads in the plain areas, most of the roads in Manipur run bending and twisting with very steep ascends and descends. The alignment characteristics of the major roads of the state have been portrayed below.
The National Highways No. 39 : Connecting Dimapur, a railhead in Nagaland, with Moreh, a border town on Indo-Burmese international boundary, via Imphal this road has remained lifeline of the state. The longitudinal profile of this road shows the above mentioned characteristics. It enters Manipur from the north through Nagaland at Mao at an elevation of about 2012 m and bending and twisting it descends Kangpokpi at about 1500 m. The road then comes down with gentle gradient upto Sekmai with the elevation slumping down to about 780 m. From here, the road straightens, with few curves, its way to Imphal and continues its straightness with few bendings upto Pallel in the south. Right from here this road ascends steeply with many turns and twists on the high steep mountainous walls upto Tengnoupal where the elevation reaches at about 2000 m. From there, the road descends down to Moreh at about 200 m. From Mao upto Moreh on the Indo-Burma Border, this road follows the steep mountainous walls with sharp curves and twists except at the plain area in the central valley.

The New Cachar Road (NH.53) : This road enters Manipur at Jiribam at about 60 m. above sea level. After following
a few kms on the Jiri Plain, this road ascends gradually with maximum bends and twists on the steep mountainous walls covered with dense forests. This road also crosses many rivers such as Makru, Barak, Irang, Iring etc. and the hill ranges with steep slopes. This road has a total length of about 224 kms. from Imphal to Jiribam.

Imphal - Churachandpur Road: This road is more straight than the National Highways mentioned above. But the road beyond Churachandpur is rather steeper with ups and downs. The elevation of Churachandpur is about 1000 m. above sea level. Churachandpur - Tipaimukh Road, with steep gradients, passes through a difficult terrain, and has a tentacular for its entire location in the hills.

Imphal - Ukhrul Road: This road starts from Imphal on the plain area towards northeast upto Litan. After crossing the Thoubal river, it follows the river on one side and the hill ranges on the other, and immediately goes upward steeply through a gorge at Lamlang Gate. Here the road runs on the eastern face of the hills and passes to the Ukhrul ranges through a saddle
or col with bendings and twists. This road finally reaches Ukhrul at an elevation of about 2100 m. above sea level, from where it continues with bends and twists upto Jesami in the north-easternmost part of the state.

The Surface Condition

The roads of Manipur in general present a sub-standard surfacing with absence of required crust thickness. Like other states of the country, Manipur also has four kinds of roads. (i) Black-topped (ii) Water-Bound Macadam (iii) Gravel, and (iv) Kutch, unmetalled, unsurfaced or unpaved. A cement concrete road of about 300 m. forms part of the urban roads at Imphal's main market – Paona Bazar.

Both the National Highways, No. 39 and 53, are black-topped throughout its length. The state highways are mostly black-topped except at some points, where it comes under water-bound-macadam which is confined in the eastern hilly region. In 1975-1976, Manipur had 1149 kms of black-topped road, 432 kms of water bound Macadam road, 295 kms of Gravel road and 1617 kms of unsurfaced roads. Thus, the surfaced roads,
including black-topped, water bound-macadam and gravel roads, formed 1876 kms and the unsurfaced roads 1617 kms. At present the surfaced roads measure 2532.4 kms and the unsurfaced roads 1792 kms.

The important element of the road surface in Manipur are the width of the pavement, bridges and culverts, embankments, road crust thickness etc. The existing roads, both in the plains and hills, cannot be maintained properly as their crust is broken up by the heavy traffic. Further, due to political disturbances, construction and maintenance work have been slowed down making the road condition bad to worse. Most of the existing State Highways have an average crust thickness of 15 cm. against the required thickness of 45 cm to 50 cm. The Major District Roads have a thickness of 8 cm to 10 cm or less, which leads to frequent breakages at several places. Strengthening of the weak and damaged standard single lane (SSL 3.75 m.) should be done by adding at least two layers of water bound macadam and black-topping. Most of the State Highways and major district roads are only standard single lane roads which require strengthening as well as widening to make them lifeline
in the real sense for the people. The Tiddim Road, Imphal - Ukhrul Road, Imphal - Mayang Imphal - Sugnu Road, Imphal - Sagolmang Road, and Imphal - Tamenglong Road require strengthening to enable them to carry a larger traffic volume.

Most of the State Highways, major district roads and other roads have lesser width of their pavements. These roads are too narrow in the hills with a width of hardly 5.5 m. It is due to difficulties in the construction of roads in the precipitous hills covered with dense forest. The heavy rainfall and human factor - the tribal population with exclusive rights over the hills and forest, hinder the widening of roads. The presence of a large number of rivers and streams in the hills with poor bridges and culverts limit the use of roads by bigger and heavy trucks on roads except on the Imphal - Dimapur Road, Imphal - Moreh Road and Imphal - Churachandpur Road. Other roads are Standard Double lane and Standard Single lane poor quality roads, which restrict the efficient and quick movement of vehicles, particularly in the hill areas.
The New Cachar Road, inspite of its being a National Highway (No.53), is too narrow to allow two vehicles to cross each other. Moreover, this road is constructed on the high and precipitous slopes of hills and mountains and the width of pavement is limited by the steepness of the mountain walls and deeply cut river valleys of rivers Makru, Irang, Barak and Iring etc. and numerous rivulets. The bridges over these rivers are also too narrow and weak to allow heavy as well as longer vehicles. Moreover, the road is one of the most tentacular in nature due to the position of the mountains and rivers. The same feature is present in other state Highways like Imphal - Ukhrul Road, Churachandpur - Tipaimukh Road and Kangpokpi - Tamenglong Road. The widening of the road is also obstructed by the dense forests in this hilly section. The roads as such are narrower in many parts, especially in the hills.

Other important elements and factors in the construction of roads and bridges are those of numerous rivers and streams with torrential flows during the rains and the frequent landslide and solifluction in the hills whenever there are heavy rains. Most of
the bridges and culverts are not only narrow but also weak and can be washed away during the heavy rains. Traffic movement, therefore, becomes a problem on such roads.

**CLASSIFICATION OF ROADS**

On their functions as linkage, the roads of Manipur can be classified into six categories:

(1) **National Highways**: These are roads which serve the state of Manipur as the life lines through which Manipur has connections with the neighbouring states of Assam, Nagaland and Mizoram, and other parts of India. These Highways are the Dimapur - Imphal - Moreh Road (N.H.39), and New Cachar Road (N.H.53). These roads are the all-weather motorable routes, which are sometimes blocked by the landslides during the rains. The total length of National Highways in Manipur is 434.3 kms. These roads serve as inter-state links. The National Highway N. 39 continues upto the border town of Moreh on the Indo-Burma boundary, and serve as an international highway.

(2) **State Highways**: These are the main lines or trunk routes of the state, which connect the state capital with district headquarters and other small towns. The
total length of these roads is 527.0 kms. Important state Highways are Tiddim Road, Imphal - Ukhrul Road, Imphal - Sagolmang Road, Imphal - Kangchup Road, Imphal - Yairipok Road, Imphal - Mayang Imphal - Sugnu Road etc.

(3) Major District Roads: These roads form link between the State Highways, and important villages, market towns, and district headquarter. The length of the major district roads is 624 kms. Important major district roads are Bishnupur - Nungba Road (Old Cachar Road), Moirang - Kumbi Road, Pallel - Chandel Road, Sugnu - Chandel Road etc. These roads link the sub-divisional headquarters with the district headquarters, and also serve as links between the State Highways and National Highways, and growth centres to towns and important settlements.

(4) Other District Roads: These roads connect large villages and headquarters of administrative units such as block and circle headquarters in the hills and small towns and big villages in the plain or valley areas. Important roads under this category are Andro Road, Hiyangthang - Nambol Road, Mahadeva - Tolloi Road,
Thanga-Sendra and Thanga-Keibul Lamjao Road, Pukhao-Kanglatongbi Road etc. The length of other district roads has been 340.3 kms\(^6\).

(5) Inter-Village Road: These roads serve as important by-passes for the important arterial roads converging to Imphal. They also link sub-urban areas and the numerous villages to the capital city and other towns. The state has a total length of 2205 kms\(^7\) of Inter-village Roads. In the plain section, the rural roads are mostly surfaced unlike the hills where they are mostly unsurfaced and unservicable for major part of the year. The Inter village Roads in the hill areas also include the bridle paths and trace paths connecting various villages.

(6) Municipal Roads: These are the roads maintained by the Municipal Boards in the Urban centres. These roads connect each and every municipal wards among themselves and with other highways - the National and State Highways and district roads. The Municipal roads are therefore, used mainly for intra-town movements. Manipur has 193.8 km of municipal roads\(^8\).
DENSITY OF ROADS

Road transport is the only mode of communication in a state like Manipur which has no rail link at present with almost negligible waterways. Therefore, the development of roads alone can gear up the economy of the state. The density of roads in a region indicates the standard of living and economic prosperity of its people.

In Manipur, roads are the cheapest means of communication, but the pattern of road density in the state differs from region to region.

In 1955-56, Manipur had 959.8 km of roads, which increased to 4324.4 km in 1984-85. The length of surfaced roads have been 2532.4 km and the unsurfaced roads 1792 km. The density of roads per 100 sq. km. of her area was 19.4 (Map 21). Similarly, the road density per 10,000 population was 30.4 km in the state as against 22.7 km for the counts as a whole (Map 22). Table 4.1 shows the roads density per 100 square km of area and per 10,000 population in each district.
Road density per 100 km² of area is quite low in the hill districts, particularly in Churachandpur where it is as low as 6.7 km as against 19.4 km for the entire state. The valley districts of course are well served by road network, which, therefore, have larger road density. In the hill district, the road density per 10,000 population is comparatively higher for their smaller population while in the valley due to heavy concentration of the population such densities are a little lower.

### TABLE 4.1

DISTRICT-WISE ROAD DENSITY IN MANIPUR, 1984-85

<table>
<thead>
<tr>
<th>District</th>
<th>Total road length (km)</th>
<th>Per 100 km² of area (km)</th>
<th>Road density per 10,000 population (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imphal</td>
<td>1136.3</td>
<td>87.2</td>
<td>20.4</td>
</tr>
<tr>
<td>Thoubal</td>
<td>494.9</td>
<td>122.2</td>
<td>21.4</td>
</tr>
<tr>
<td>Bishnupur</td>
<td>242.9</td>
<td>45.8</td>
<td>17.2</td>
</tr>
<tr>
<td>Senapati</td>
<td>446.5</td>
<td>13.6</td>
<td>28.7</td>
</tr>
<tr>
<td>Churachandpur</td>
<td>307.6</td>
<td>6.7</td>
<td>22.8</td>
</tr>
<tr>
<td>Ukhrul</td>
<td>664.6</td>
<td>14.6</td>
<td>80.1</td>
</tr>
<tr>
<td>Tamenglong</td>
<td>632.3</td>
<td>14.4</td>
<td>101.5</td>
</tr>
<tr>
<td>Chandel</td>
<td>399.3</td>
<td>12.1</td>
<td>70.7</td>
</tr>
<tr>
<td>Manipur</td>
<td>4,324.4</td>
<td>19.4</td>
<td>30.4</td>
</tr>
<tr>
<td>INDIA</td>
<td>1,554,204.0</td>
<td>47.3</td>
<td>22.7</td>
</tr>
</tbody>
</table>

Source: Statistical Handbook of Manipur 1985, pp. 10, 134-40

Basic Statistics of North Eastern Region 1987, p. 86.
AIR TRANSPORT

Air transport is now playing a dynamic role in the regional development⁹. It is also a direct force in the economic production. One of the great advantages of the aeroplane as compared with surface transport is the possibility of using it over land and water¹⁰. The extremely high and continuously growing speeds, the unlimited range of operations and extraordinary manoeuvrability constitute the major of air transport.

Of all the other forms of transport, air transportation has freed itself from most of the factors of physical geography. The high mountains of the world are crossed by scheduled air services during all the season. Distances become shorter or places become near due to speedy air transport. Topography, however, is being considered in regard to location of airports. Besides meteorological elements also have their effect on air transport.

Manipur is fortunate in respect of air transport. Imphal is air linked with other neighbouring states of North-Eastern India inspite of the various
physical barriers. The small oval-shaped valley, surrounded by ranges of high hills and mountains, shelters the Imphal airport, located at a distance of 8 kms south of Imphal. However, the adversity of flying weather such as poor visibility during the foggy days and rainy days, heavy rains and cloudiness occasionally affect the air transportation.

**Location of Imphal Airport**

The location of airport depends upon the fact that it exists not only to enable aircraft to land and take off safely but also to facilitate the transfer of passengers and freight from one element to another. K.R. Sealy had distinguished three main factors influencing the location of airports: a) Technical requirements of the aircrafts, b) Physical requirement of the site and c) Economic requirements of the state.

The location of Imphal airport may be unsuitable from the point of nearness to the city, but on the economic consideration the site is quite favourable, as Imphal is the highly clustered settlement site in the entire region. (Map 23).
NAVIGABLE WATERWAYS

In Manipur, navigable rivers are very few, but many of the existing rivers were used for water transport before the development of roads.

However, Barak, Jiri, and Imphal rivers are navigable by country boats mostly during the monsoon season. In the southern part of the central valley, the rivers are, to some extent, navigable during the rainy season. As the rivers of the state in general are too narrow and contain sufficient water for navigability only during the rainy season, they remain unsuitable for navigation for major part of the year. Even during the rains these rivers are rarely used for water transport for their swift-flow.
REFERENCES


3. Ibid.

4. Ibid.

5. Ibid.

6. Ibid.

7. Ibid.

8. Ibid.


12. Ibid.