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Transport routes are the veins and arteries through which circulate all types of improvement and development. In fact, success of economic development planning depends on the levels and degree of development of transport systems in a region. It may not be overexpression to mention that all the developmental planning e.g. socio-economic, socio-cultural, socio-political, geo-environmental etc. depend to much extent on the network of transport system, which in turn helps to find out the level and standard of the people, or the socio-economic condition of the people. There are regional/spatial variation in development due to inequality in transport system, creating accessible and inaccessible areas. However, the accessibility and inaccessibility are governed primarily by the physical factors such as physiography, drainage, climate etc. Regions with poor accessibility remain isolated. In fact, an isolated region is always associated with the backward economy. The development of transport arteries influence not only the economic development but also proper utilization of available resources of the region. It further helps in the proper location of the man and materials to his environment.
Thus, transportation has a direct bearing on the development. There exists a positive correlation between investment and development, and between transportation and development because investment in transport and communication is a must in any programme of economic transformation. There, thus, exists an undetachable relationship between the transportation and the degree and level of development.

The present study aims to unfold the system of transport, particularly roads, in Manipur, which has varied topographical features associated with difficult terrain and dense growth of vegetation under varied climatic conditions. The state, with its location in the peripheral region of Eastern India, is identified with its backward economy. The study analyses the transport network and suggests a strategy for its development to accelerate the pace of economic development of Manipur, a state rich in natural and cultural resources.

Manipur (Area: 22,327 km², Population: 14,20,953 in 1983) has great inequalities in her socio-economic development. Its plain and the hill areas, both in rural and urban sectors, have imbalances in their
development. An attempt has been made in the present study to analyse the pattern of such imbalance and suggest remedial measures including opening of transport routes in inaccessible areas.

In accordance with the above objectives an analysis of the transport network has been presented in historical perspective with help of descriptive as well as quantitative techniques such as graph theoretic or topological indices i.e. cyclomatic number, Alpha, Beta, Gama, Eta, Pi, Theta and Iota indices etc. Besides Detour indices and the various measures of individual elements of transportation networks such as associated number, diameter, degree of connectivity, dispersion, accessibility and circuity are adopted to evaluate transportation capacity.

Manipur comprises of a central valley, a midland plain surrounded by the Manipur eastern and western hills. The valley constitutes about one-tenth of the state area, while the hill areas form the remaining nine-tenth of the area. A tiny plain formed by the Barak river-the Barak basin - lies on the western flanks. The state is divided into
eight revenue districts - Imphal, Thoubal and Bishnupur in the central valley, and Ukhrul, Chandel, Senapati, Tamenglong and Churachandpur in the hills.

The state enjoys a sub-tropical monsoon climate with dry winters, hot and wet summers, and a relatively abundant and widespread rainfall. The period from December to February constitutes and cold season, March to May the hot weather season, mid-May to September the Monsoon season and mid-September to November the season of retreating monsoon. The soils of the state are broadly classified as ferruginous red soils in the hill areas and alluvial soils in the valley and Barak basin, and are well suited to the cultivation of paddy and other crops.

Manipur is dominated by mixed types of forests which are poor in quality as well as in accessibility. Forests occupy almost two-thirds of the state areas, mostly in the hill districts. Forest resources include important timber species such as teak, toon, Khangra, pine etc. Besides, the bamboo forests
occupy most of the area of the western hills. A bamboo chipping plant is being established at Jiribam for supplying bamboo chips to the Cachar Paper Mill of Assam. A few minerals are also found in Chandel and Ukhrul districts. Important among them are the limestone, nickel, copper etc. A Mini-Cement Plant has been commissioned at Hundung in Ukhrul district recently to utilize the limestone found locally and in the neighbourhood.

Agriculture is the main occupation of the people in the state. Around 67% of the working population is engaged in the agricultural pursuits as cultivators and agricultural labourers. Cultivation is almost monocropped with paddy accounting for 90% of the agricultural product and 86% of the total cultivated area. It is the staple food of the people and is grown in both the hill and plain areas. Maize, wheat, mustard, potato etc. are other crops grown in the state. A number of irrigation projects have been taken up to make the agriculture a double-crop affair.
The major impediment in the way of rapid economic development of the state has been the absence of adequate infrastructure in terms of availability of transport and communication, power, irrigation etc. Efforts have been made for the development of infrastructure to give a boost to the economic development of the state.

Population distribution is quite uneven in Manipur. Density ranges from 14 persons per km² in Tamenglong district to 572 person per km² in Thoubal district. The regional variation is from 24 per km² in hills to 415 per km² in the plain/valley. Population growth rate has been very high in the last three decades. The higher growth rate especially in Senapati, Churachandpur, Tamenglong and Chandel districts bear the evidence of the influx of immigrants into these districts from the neighbouring states. There are 32 towns including Imphal, the capital city, which have been grouped into class I (Imphal city), class III (2 towns), class IV (4 towns), class V (9 towns) and Class VI (16 towns).

In ancient Manipur transportation routes
traversed both the hills and plains. These routes were used mainly for the trade and military purposes by kings, princes and traders - since 500 B.C. During the medieval period, these routes were frequented by the indigenous settlers as well as the invaders. New lines of transport were opened to connect the neighbouring regions, including Burma. Navigables channels were almost confined to the rivers and lakes. Kings used to move by rivers especially along Imphal, Irl, Barak and Jiri rivers. With the introduction of wheeled vehicles, during the modern times new roads, both metalled and unmetalled, have been laid for speedier movement. After the Independence of the country and introduction of five year plans, the road development programmes have been initiated to make them serve the state better.

As regards the distributional pattern of the transport network, Manipur is served mainly by roads. The state is linked by the National Highway No. 39 and 53 with the neighbouring states. The NH 39 passes through Nagaland in the north to link the railhead at Dimapur in Nagaland, and NH 53 in the west to link to railhead at Silchar in Assam with the state capital. The
highways and other roads form some crude pattern like pentagonal, tentacle, cobweb and radial etc. following the geographical characteristics of the region particularly the relief features in different parts of the state. Most of the roads run twisting and bending with steep ascents and descents. Sometimes the roads are slided due to solifluction or lanslides and often subjected to frequent blockage of road for a long time.

The road surface can be grouped into black-tooped, water-bound macadam, gravel and Kutchha types. Width of the roads are very narrow particularly in the hills except the N.H. 39, where negotiating of two vehicles from opposite direction is very difficult. The roads are divided into five classes viz, the National Highways, the State Highways, the Major District Roads, Other District Roads and Inter Villag Roads. Besides, there are Municipal and Regional Road maintained by the town committees and the North Easte. Council. The density of roads varies from district to district, of which Imphal district has the highest density while Chandel district has the lowest per 100
km² area. While the density per 10,000 person is the highest in Tamenglong district, it is the lowest in Thoubal district.

Manipur lacks big and navigable rivers. At present Jiri and Barak rivers are used for transhipment of few commodities in the interior areas, particularly during the cool and dry seasons. The air services have been improved and the state is well linked with neighbouring states and Delhi by daily boeing services. Vayudoot Services operate thrice per week to connect Imphal with Calcutta, Dimapur and Silchar. However, Imphal Airport, the only airport in the state, needs modern amenities including night landing facilities.

Coming to the degree of accessibility by road, these roads provide accessibility to all the district. However, the inaccessibility in terms of road network is the highest in Tamenglong and Chandel districts, where more than 30% of the area remain inaccessible throughout the year. The plain districts have the highest degree of accessibility. The poorly accessible regions lying beyond 16 kms are the north-west and western parts
of Tamenglong district, southeastern and southern parts of Chandel district, south-eastern and north-eastern parts of Ukhrul district, and western and southern parts of Churachandpur district. Inaccessibility in terms of hours isochrone is also the highest in Chandel district followed by Tamenglong and Churachandpur districts.

Focussing on the different aspects of the traffic flow, the pattern of passenger traffic (bus traffic) flow shows the concentration of all the buses in the central part in the capital city of Imphal, where about 900 buses are aggregating daily. Thus, Imphal serves both the originating as well as the destinating stations of the buses from 11 or more different directions. However, there are some nodes where the buses are originating and terminating. The bus services are conducted by the Manipur State Road Transport Corporation (MSRTC) and other private bodies. The inter-state bus services are also conducted by both the MSRTC as well as the private bodies like Blue Hill Travels, Green Valley Travels, Manipur Golden Travels and many others. Earlier inter-state services were controlled by the government agencies only. At
present the passenger traffic is the highest on the Indo-Burma Road, followed by Tiddim and Imphal-Dimapur Road. Goods traffic is mostly confined on the National Highway 39 through which all the requirements of the State are brought through Nagaland. Besides, the buses too carry a lot of goods traffic. Most of the vegetables and fruits are brought by buses especially from Thoubal and Bishnupur districts. Hence, the goods traffic on all other roads, except Imphal-Dimapur Road, is susceptible to local influences. The nature of goods carried is almost closely related to the economic activities of the areas, from where they originate.

River traffic is almost negligible now-a-days due to the opening of all-weather roads in most parts of the state. However, it is confined along the Jiri river at Jiribam, where it is used for local movements of both goods and the people. Before the linking of Sendra and Thanga with the mainland, water transport was predominant over the Loktak lake, but it has declined now. However, fishing is mainly done with the help of boats and canoes in Loktak and its water bodies at present.
Urban transportation also assumes a greater importance because it has been the result of the location, growth and morphology of the towns. Had there been no transportation routes, the towns might have no growth at all. Among the selected towns in Manipur in the present study, Imphal has its typical roadframe. Most of the roads radiates from the city centre or C.B.D. However, some of the intra Municipal roads are too narrow for heavy vehicular traffic and changed into one-way traffic on most of the urban roads. But congestion is not much in other towns. Traffic congestion in Imphal is mainly due to 1) unplanned road pattern, 2) frequent illegal encroachment by the public, 3) increasing number of traffic/commuters and concentration of traffic in the C.B.D., 4) existence of parkings for all types of vehicles and buses for inter-town transportation.

As regards rural transport most of the villages are connected by unsurfaced Inter Village Roads (IVR). Cart tracks also provide the main lines of movement in the rural area. The route density varies according to the topography. Bullock cart is widely used for transportation of goods for all purposes.
in the rural areas. Rural traffic mostly consists of agricultural commodities such as rice and straw, besides fuelwoods, timber, grasses for roofing from the forests. In the hills, head loads as well as the animals are used for traffic of forest and agricultural produces. However, movement is restricted during the rainy days due to the absence of good roads. The pattern of traffic is the same among the hill districts.

Manipur can be divided into three transport regions viz. The central plain, the eastern hill districts and the western hill districts. The first comprises the Imphal, Thoubal and Bishnupur districts; the second Ukhrul and Chandel districts; and the third Tamenglong, Senapati and Churachandpur districts and outlaying Jiribam sub-division of Imphal district. Considering the degree of accessibility, nature and density of traffic, these regions are demarcated, which include one or more than one economic region.

A thorough study of the transport network has highlighted some problems on the inter-regional, rural and urban levels. Those problems are inaccessibility by roads, poor alignment and surface conditions of
roads, narrow width of the roads, lack of bridges and culverts, co-existence of traffic on all the urban roads, unsurfacing of hill and rural roads, lack of timely maintenance of the roads leading to breakage and damages. Organisation problems and statutory problems etc. The absence of good surfaced roads is the main problem in rural areas both in the hills and plain.

In light of the above several measures have been suggested to solve the transport bottlenecks. The road plan for 20 years by the State Public Works Department is quite comprehensive. However, a few addition of roads in the remote areas to connect the nodal points and big villages by all-weather roads have been suggested, which will at least bring a balanced density of transport network as well as all-weather connections to all District and sub-divisional headquarters and other nodal towns and centres. The cyclomatic value for the existing and the proposed roads are also calculated to have a permissive idea. Besides, it is also suggested for widening, strengthening and bifurcation of the Highways and lanes in the urban area. Moreover it is also suggested to have an overbridge if needed in Imphal along the Naga and Nambul rivers from
Khoyathong point to Keishamthong which will not only divert the heavy traffic of the N.H.39 but will also have a lot of land which can be utilised as lanes and parking sites.

In addition to the above, introduction of tramways and railways from Churachandpur to Ukhrul, and Senapati to Chakpikarong via Imphal has been suggested which will revolutionize transport system as well as economy of the state. Besides, ropeways from Haflong to Kangpokpi and Ukhrul, Jiribam to Mungba and Jiribam to Kangchup via Tamenglong have also been suggested. Installation of pipelines for bringing the oil and the natural gas from the neighbouring states-Assam and Tripura, are also suggested which will certainly boost up the economy of the state and level of economic development in various parts of the state. It is also suggested to launch a multipurpose programme to divert the water of Nambul river, which occasionally causes flood in Imphal destroying the roads, at a suitable site, so that the city may be protected against untimely floods and the water be used for agricultural and other uses.