JOURNAL OF SOCIAL STUDIES August 2024
ISSN: 2348-7747 X(2): 1-25

Implications of Infrastructure on livelihoods: A comparative analysis of Hills and Valleys in Manipur

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Abstract:

Infrastructure has positive implications for people's livelihood conditions, when it is adequately available and conveniently accessible. The present study included economic infrastructures such as transportation, communication, and electricity. It adopted a multi-stage sampling method for the selection of six districts and 12 blocks based on the availability of infrastructures in both the hills and valleys of Manipur. The collected data were compared and contrasted with respect to the two areas. Access to affordable and better condition of road transportation in the valleys have resulted in a larger scale agricultural production and a higher income of business establishments, as compared to the hills wherein available roads are mostly un-surfaced. Unreliable telecommunication services in remote areas of the hills have isolated people apart from failing to draw the government's attention. In the valleys, the use of electricity is higher for commercial purposes due to the regularity of its supply, which promotes their livelihood conditions. Consequently, the average income from the livelihood activities of the hills is lower than the valleys. Therefore, adequate availability of infrastructure is needed for the sustainability of livelihood conditions.

Keywords: *infrastructure, livelihood, hills, valleys, accessibility*

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Introduction

Sufficient availability of a robust infrastructure foundation within a state results in a favorable change in the living conditions of people. Infrastructure has been classified broadly into economic and social infrastructures. The present paper mainly focuses on economic infrastructures such as road transportation, communication, and electricity. People tend to settle down in a place where these infrastructures are adequately available and conveniently accessible so that their livelihood conditions improve. Livelihood means are income-generating activities such as agriculture and allied activities and business establishments that support people's well-being and standard of living. To enable and enhance such activities, infrastructural facilities play a vital role in transporting goods and products, connecting people, and minimising manual works. Individuals determine their levels of accessibility to infrastructure based on factors such as proximity and affordability. However, in India, the distribution of infrastructure is largely based on the size of the population. It has significant effects on the hilly, tribal, and rural areas where the population is sparsely distributed. Consequently, it adversely affects the state of Manipur, which is topographically divided into two main distinct land features, namely, hills and valleys. The hills cover 90 percent of the total geographical area, while the valleys cover 10 percent and accounted for a higher population of 59 percent in 2011 (DES, 2017). This spatial distinction is evident in the disparity of socio-economic conditions such as income, occupation, and living standards. It is observed that these conditions appear to be better in the valleys compared to the hills.

People need economic infrastructures to be adequately available and conveniently accessible to enhance their livelihood activities and make them more sustainable. The success of livelihood support strategies is strongly linked to the successful efforts towards the revitalisation of local infrastructure (Goovaerts, Gasser, and Inbal, 2006). A good transport system is an essential condition for the development of agriculture. It makes possible the timely availability of agricultural inputs to farms and timely marketing of produce, especially perishable products (Lokesha and Mahesha 2017). India lacks a major support for the manufacturing sector due to a lack of infrastructural facilities such as train and road networks, improvised communication systems, and electricity availability (Chitkara and Nagpal, 2017).

Nayak (1999) observes that infrastructure is multidimensional and multipurpose and is accepted as a complementary sector and a boom to other sectors of the economy. Its insufficiency and slow development depend on how well governance in public finance. That affects other sectors of the economy to meet the need of the growing population in the country as well as in the state. South Korea is considered to have reached the status of a developed economy due to its government-led infrastructure (Dash, 2017). The Government of India, since the eleventh Five Year Plan, has given a new emphasis on inclusive growth across categories of population, including regional categories with atleast 10 percent of the GDP earmarked for the North Eastern Region (Planning Commission, 2008). However, regional imbalances continue to prevail across various sectors, especially in the infrastructure sector. In Manipur, major infrastructures are mostly located in the valley districts, resulting in a huge disparity between the hills and the valleys in respect of all the key indicators of development (Ziipao, 2019). Considering the importance of infrastructure as a contributing factor to livelihood development, its adequate availability has a positive impact on the livelihood conditions of people. However, unequal distribution of it has hindered the inclusive development of the state. Therefore, the present study focuses on implications of infrastructure on livelihood conditions in Manipur. Its objective is to examine the state of infrastructure in terms of its availability, accessibility, and the resultant disparities between the two areas to understand how infrastructure triggers livelihood conditions.

Methodology and Data Source

The study is based on primary field data collected from the hills and valleys of Manipur. Prior to the creation of new districts in 2016, there were 9 districts in the state (DES, 2017). The present study is based on the old division of districts. It adopted a multi-stage sampling technique. First, the state was grouped into two clusters, namely, hills and valleys, and six districts are drawn (three districts each from the hills and valleys) for the study. The selection was based on the best, medium, and poorest availability of infrastructural facilities such as road transport and electricity in terms of population served, and geographical area covered. From the hill districts Churachandpur, Tamenglong, and Senapati were selected while the

valley districts included Imphal West, Thoubal, and Bishnupur. Secondly, using the same criteria, 12 blocks were drawn from selected 6 districts with two blocks each having the best and poorest available infrastructure in each district. Thirdly, from each block, two villages or wards (core and peripheral) were drawn based on proximity to the block headquarters, constituting a sample area of 24 villages or wards. Fourthly, a sample population of 10 individuals each from the 24 villages or wards forming 240 sample populations was randomly drawn for personal interviews, using a semi-structured questionnaire.

The primary field survey was conducted from June to September 2019. The reference period of the present study spread over five years preceding the date of the field survey with the idea being to understand the changing patterns of infrastructural conditions such as road, telecommunication services, and electricity supply. For example, roads need up-gradation or reconstruction work at least once in five years. However, it was one year for variables related to income with a view to obtaining accurate and more reliable information from the respondents. Data were collected using personal interviews and unstructured observation methods. Respondents of the personal interview included i) individual respondents and 2) village/ward level respondents. Observations were carried out as part of understanding the road condition, reliability of telecommunication network, and supply of electricity by taking the reference period between the first day and the last day of the field survey.

Using the primary data, the present study has attempted to explore the overall infrastructural condition and its implications for livelihood conditions in the state. The infrastructural conditions have been measured in terms of their availability, accessibility, and affordability, while livelihood conditions in terms of people's occupation, monthly income, and income from agricultural production, and business establishments. The study has employed simple statistical methods like percentage distribution and average. To cross-examine the relationship between two or more variables, data were cross-tabulated. Subsequently, the collected information was analysed and interpreted by the way of comparing the hills and valleys in order to draw inferences.

Infrastructural Conditions in Manipur

Road Transportation:

Road transportation is the main mode of transport system in Manipur. It is the most widely used transport system that connects the nook and corner of the state. It includes road conditions, frequency of vehicle plying, affordability, and ownership in terms of public and private transport systems. Road condition depends on the types of road such as National Highways (NH), State Highways (SH), district roads, and inter-village roads. Generally, NH and SH are broad and surfaced, whereas district and inter-village roads are either surfaced or un-surfaced roads. Un-surfaced roads are mostly meant for seasonal road transportation with vehicles being unable to ply during rainy seasons. The total length of NH and SH in Manipur works out to 1,630 km and the total geographical area to 22,327 sq. km, of which 1,210 km and 20,089 sq. km belong to the hill districts and 420 km and 2,238 sq. km to the valley districts (DES, 2017). The NH and SH road density of 0.06 km per every sq. km of the geographical area in the hills is poorer than 0.19 km of the same in the valleys. It is due to the higher availability of NH and SH that connects the capital city (Imphal). Most of the district roads and inter-village roads remain surfaced due to the plain topography and dense population.

The passenger vehicles include buses, wingers, vans, and autos. Vehicles other than these are used for the transportation of goods. The valleys have an adequate frequency of vehicles plying for passenger services with a reasonable fare of transportation. In the hills, the poor road conditions, especially in remote areas normally hinder the movement of passenger vehicles. In terms of road infrastructure, Churachandpur is the best hill district, however, its sub-divisional headquarter Henglep being connected to an un-surfaced steep road and is the only seasonal motor-able road. This results in the plying of vehicles thrice or less in a week to the district headquarter with a high fare of Rs. 300 for 80 km. The available vehicles include trucks, shaktimans, and DI-407 for transportation of both passengers and goods. Similarly, for long unmaintained surfaced roads connect Purul and Koide villages from Maram junction of NH-39 in Senapati district. Only a private taxi called

Tata-sumo plies three times a day for the transportation of passengers and goods between the two villages and the district headquarter with a fare of Rs. 120 per head.

People's accessibility levels to road transportation depend on the condition of roads such as surfaced state, broadness, durability, timely maintenance, regularity of vehicles plying for passengers and their affordability. Those fulfilling these indicators offer a higher accessibility level to road transportation. People with high access to road transportation accounted for 67 percent of the hills, which is lower than 78 percent of the valleys. The average distance between the localities and district headquarters works out to 32 km, with an average fare of Rs. 89 in the hills. In the valleys, it is 9 km with an average fare of Rs.19. Therefore, the cost of transportation per 1 km is approximately Rs. 3 in the hills and Rs. 2 in the valleys. The poor condition of roads affects their efficient use and the cost of transportation that eventually affects the economic conditions of people in the hills. This further affects the mobility of people and their ability to access services for a long period.

An inadequate public transportation system results in increased transportation costs on the part of people in accessing health and educational facilities and other daily necessities. According to the Department of Information and Public Relations (June 2017), the government launched Manipur State Transport (MST) buses on 25th June 2017, with the objective of connecting the capital city (Imphal) with some major towns. In the study areas, buses are available from Imphal to Tamenglong and Noney in the hills and Moirang and Kakching in the valleys. The fare for MST buses is 50 percent less than that of private passenger vehicles, providing a significant cost-saving advantage for individuals residing in and near the routes. However, its supply shortage is filled by individuals and corporations with a higher transportation cost fixed. Consequently, private transporters are able to monopolise the transportation system in the state, affecting the affordability of fare on the part of poor people in particular.

Poor road conditions are mainly caused by an improper implementation of road development programmes like Pradhan Mantri Gram Sadak Yojana (PMGSY). PMGSY is a rural road development scheme launched on 25th December 2000. Road quality under the scheme guidelines includes surfaced with cement, side drainage,

cross drainage, and protection works or retaining walls wherever required (Ministry of Rural Development, 2012). However, the stated road qualities are rarely fulfilled during the implementation of works. It is observed that PMGSY roads in Purul and Tamenglong blocks in the hills and Kwashiphai in the Bishnupur district of the valleys remain un-surfaced, while in Koide village of Senapati district, the road is surfaced with a very low quality that even grasses grow through it. Roads under the scheme in Henglep block in Churachandpur district are under construction. The issues of slow execution and unsatisfactory results related to road infrastructure projects in Manipur follow from the authorities who implement the projects, local politicians and bureaucrats, and underground groups (Downie, 2015). Thus, the unsatisfactory implementation of road development programmes and projects has affects the road transport condition besides impeding the development process of the state.

Communication Services:

The whole world has become smaller with the faster development of communication technology. Communication requires various means and mediums to transfer information to people. In this age, there are various types of Information Communication Technology (ICT) such as print news, television, telephone, and others for dissemination of information. Among these, mobile phone is extensively used for social and economic activities. Despite poor network connectivity, it was found in every household of respondents, which makes it relevant for the present study on telecommunications. It is one of the fastest-growing infrastructures in India. Its growth rate in terms of teledensity in the Northeast circle, which was 79 percent against all India's 81 percent as on October 2015 (TRAI, 2015). It has increased to 84 percent and 92 percent respectively, as on January 2019 (TRAI, 2019). Despite its faster growth and delivery of more reliable of its services for users, there are large geographical areas where the coverage of telecommunication network service is very poor, particularly in hills.

Telecommunication network services are more reliable in the valleys with 89 percent of the respondents enjoying fair access as compared to 53 percent of the hills. For example, Henglep villagers go to a certain place where the network is available when

they want to make a call. The unreliability of telecommunication services has isolated the villagers from connecting with their friends, relatives, and other business partners for their social lives and economic activities, thereby affecting the daily lives of people, especially in times of emergencies. Access to good and reliable telecommunication services changes the lives of people through the exchange of information with a positive impact on livelihood in particular. Its usage has a considerable contribution to various aspects of their daily lives. In the state, only people living in the valleys and urban and semi-urban areas of the hills have good access to it.

Electricity Supply:

The electric power supply is a prerequisite for the modern world of work and daily lives due to a considerable development in the field of technology. Its accessibility level is measured in terms of having connectivity and affordability. In terms of connectivity, all the localities in the study area and all sample households are connected with the electricity supply. The nature of payment for electricity charges is post-paid in the hills, whereas it is pre-paid in the valleys. Post-paid payment in the hills is further classified into monthly payment in the urban areas and quarterly or half-yearly lump-sum amount through Village Authority (VA) in the remote areas. Moreover, some villages such as Henglep, Tuilaphai, Koide, and Purul were electrified free of cost through BPL connection. Under this connection, households pay a maintenance fee which is collected by the VA. The collected amount ranges from Rs. 20 to Rs. 50 per month. It fluctuates depending on power disruptions caused by natural calamities such as storms, falling trees on main wires, and landslides. The average monthly electricity charge in the hills works out to Rs. 210, which is lower by more than twice the amount in the valleys at Rs. 531. The lump-sum payment and electricity connection to BPL households in the hills are the main reasons for the lower amount.

Access to electricity means having electricity connectivity, which does not necessarily mean that all people are uniformly satisfied with it. People's satisfaction levels with electricity supply depend on its daily availability in terms of hours. According to the VA and ward members, the supply of electric power is available for 16-24 hours,

except in villages/wards of Tamenglong district and Purul in Senapati district, where it is available for 12-16 hours for the last five years. People's satisfactory levels on electricity supply in the valleys are higher as compared to the hills. In the hills, individuals express discontentment with the lack of maintenance of electricity services during power outages caused by natural disasters. In the valleys, people are dissatisfied with the electricity department's failure to provide 24 hours of electricity supply every day after installation of prepaid connection. Electricity supply has been regular in the valleys in terms of hours per day due to the installation of a pre-paid system for almost a decade while in the hills, it is regular for the past three to four years despite the non-installation of a pre-paid system. A better state of it during the survey was mainly due to significant initiatives taken by Manipur State Power Distribution Company Limited (MSPDCL) since February 2014 under the World Bank-supported Technical Assistance and sufficient support from the state. The implementation of schemes by MSPDCL has improved the supply of power from 10 to 12 hours at District Headquarters to about 18 to 24 hours and six to eight hours to about 15 to 18 hours a day in the hills (Mittal, Saraswat, Gupta, and Gaba, 2016). Some of the villages have been electrified only in recent times. After electrification, people are spending less on electricity use than what they spend on kerosene for oil lamps and traditional lamps. Its adequate availability has a wide range of positive impacts on the living conditions of households, as it makes daily lives easier through the use of machines. Therefore, its widespread exposure and access in the valleys before the hills have had a greater advantage in its usage for livelihood enhancement.

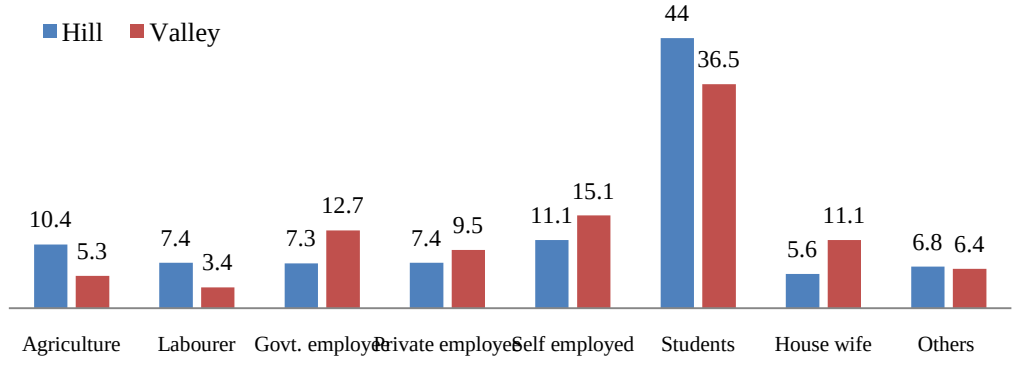
Livelihood Conditions in Manipur

Manipur is predominantly an agrarian economy. However, the absence of large industries continues to hinder economic development and employment opportunities. The major means of livelihoods include agricultural and allied activities, business establishments, employment in government and private organisations, and daily labour.

Occupation and Income:

The nature of occupation differs from one person to another based on the available opportunity, interest, skills, and professionalism. Occupation is one on which maximum labour time is spent (NSSO, 2001). The present study also considered an individual's main occupation in which maximum labour was spent by that person during the reference period. The sample consisted of dependent students, housewives, and others such as old-aged persons, infants, and persons with disabilities and workers. Workers are further classified based on their occupations. Agricultural workers are those who cultivate their own land as well as other lands as tenants. Daily labourers are those who engage in agricultural and non-agricultural works and receive wage payments daily. Government employees refer to workers who received their pay from the central and state governments. Private employees refer to workers who receive their pay from private companies, institutions, and NGOs. And self-employed refer to those working in their own business establishments. The distribution of workers in each occupation is presented in Figure 1.

Figure 1: Distribution (%) of the individual's main occupations by hills and valleys in Manipur



Source : Primary field survey

Livelihood status is determined by the income of a person or household. A household's monthly income includes annual agricultural products (total production in a year divided by 12 months) and the income of all the family members. It ranges from Rs. 3,100 to Rs. 1,16,000 in the hills whereas it ranges from Rs. 9,000 to Rs.

1,80,000 in the valleys. The average household monthly income of Rs. 34,638 in the hills is lesser than Rs. 48,306 in the valleys. Thus, there exists a wide income disparity between the hills and valleys.

Agriculture and Allied Activities:

Agriculture is one of the main occupations in the state. Its workers could be divided into two categories, namely, people who cultivate their own agricultural land and tenants who cultivate rented land from landlords. There are three main types of agricultural practice such as permanent, terrace, and shifting cultivation. The permanent type of agricultural practice is normally found in plain areas where land is owned by persons. Under terrace cultivation, the land is permanent in terms of ownership, however, normally it is practiced on the hill slopes. It mostly depends on monsoon rains due to higher altitudes location where irrigation facility is difficult to access. Under shifting cultivation, the land is neither permanently owned nor rented with land cultivated for a year or two. In the hills, it is widely practised along with other types of cultivations, whereas in the valleys, all agricultural fields are permanent lands. The agricultural features of the hills and valleys are presented in Table 1.

Table 1: Distribution (%) of households' agricultural features by hills and valleys in Manipur

Particulars		*Hills*	*Valleys*	*Total*
		% (No.)	*% (No.)*	*% (No.)*
Types of agriculture land	Permanent	68.6 (48)	100.0 (56)	83.3 (105)
	Terrace	7.1 (5)	0.0 (0)	4.0 (5)
	Shifting cultivation	24.3 (17)	0.0 (0)	13.5 (17)
	Total	**100.0 (70)**	**100.0 (56)**	**100.0 (126)**
Size of agriculture land	Below 1 hectare	72.9 (51)	73.2 (41)	73.0 (92)
	1 - 3 hectares	24.3 (17)	23.2 (13)	23.8 (30)
	3 - 5 hectares	2.9 (2)	3.6 (2)	3.2 (4)
	Total	**100.0 (70)**	**100.0 (56)**	**100.0 (126)**
Irrigation facility	Yes	37.1 (26)	58.9 (33)	46.8 (59)
	No	62.9 (44)	41.1 (23)	53.2 (67)

	Total	**100.0 (70)**	**100.0 (56)**	**100.0 (126)**
Fertiliser used	Yes	12.9 (9)	83.9 (47)	44.4 (56)
	No	87.1 (61)	16.1 (9)	55.6 (70)
	Total	**100.0 (70)**	**100.0 (56)**	**100.0 (126)**
Ploughing	Tractors	44.3 (31)	94.6 (53)	66.7 (84)
	Animals	30.0 (21)	5.4 (3)	19.0 (24)
	Others	25.7 (18)	0.0 (0)	14.3 (18)
	Total	**100.0 (70)**	**100.0 (56)**	**100.0 (126)**
Main crop of cultivation	Paddy	67.1 (47)	80.4 (45)	73.0 (92)
	Paddy with vegetables	20.0 (14)	19.6 (11)	19.8 (25)
	Cash crops	12.9 (9)	0.0 (0)	7.1 (9)
	Total	**100.0 (70)**	**100.0 (56)**	**100.0 (126)**
Production sufficiency	Not sufficient	18.6 (13)	12.5 (7)	15.9 (20)
	Subsistence	71.4 (50)	64.3 (36)	68.3 (86)
	Market surplus	10.0 (7)	23.2 (13)	15.9 (20)
	Total	**100.0 (70)**	**100.0 (56)**	**100.0 (126)**

Note : Figures in parentheses are actual numbers.

Source : Primary field survey

Paddy, being a staple food, is widely cultivated in the state and accounts for 73 percent of the main crop cultivation (Table 1). Most of the farmers in the valleys cultivate vegetables and other cash crops after harvesting paddy. Some farmers cultivate paddy and vegetables at the same time, particularly in the hills, under shifting cultivation. Despite a considerable dependence on agriculture, some farmers are unable to achieve self-sustenance, and the majority of them are not in a position to produce a surplus marketable agricultural product. Only about 16 percent of the farmers produce a marketable surplus in the state. The average annual agricultural production[3] of paddy works out to Rs. 32,961 in the hills, which is lower than Rs. 35,176 in the valleys. Low agricultural production in the state is mainly due to the small agricultural landholdings and lack of agricultural infrastructures such as

[3]Average annual production of paddy was collected in terms of bags and tins. Here, 1 Bag = 5 Tin and 1 Tin = 10 Kg. therefore, 1 Bag = 50 Kg. of paddy. The price of 1 Bag = Rs. 700, if Rs. 700/50 Tins = Rs. 14 per Kg.

irrigation facilities, ploughing tractors, and fertilisers. Most of the agriculturists hold an area of land less than one hectare in both the areas. Only 2 to 3 percent of them have more than three hectares of agricultural land. It is important to note that mere ownership of agricultural land does not ensure sufficient agricultural production.

People living in the hills have a higher dependency on agriculture and forest products, however, average annual agricultural production is lower than in the valleys. Valley cultivators are better facilitated by agricultural infrastructures in that 95 percent use tractors, 59 percent of them have irrigation facility and 84 percent use fertilisers as compared to the hills cultivators of 44 percent, 37 percent, and 13 percent, respectively (Table 1). All these factors have led to an increase in agricultural production in the valleys. In the hills, animals are mostly used for ploughing fields. The use of tractors is minimal due to the widespread practice of shifting and terrace cultivation. Moreover, with the rough topography and higher altitude locations of terrace land, farmers are forced to depend on monsoon rains.

Besides, some other livelihood activities, such as the cultivation of cash crops, fishing, and farming, are practiced in both the hills and valleys. Farmers mostly cultivate cash crops after harvesting paddy, depending on the crop season. This practice is predominant in the valleys, primarily due to the higher utilization of permanent agricultural land, modern technology, improved marketing facilities, and lower transportation costs. Orange cultivation is mostly found in Tamenglong and Senapati districts in the hills. Fishing is widely practised in Thanga village under the Moirang block at Loktak Lake in the valleys. It is mostly practised by menfolk with womenfolk selling to the market.

Generally, hill and tribal people largely depend on agriculture and forest products for their livelihoods. However, some households do not possess a piece of agricultural land in the hills. The reasons include submersion of agricultural land in Lamka block due to the construction of a dam called Khuga dam. The victims received only 50 percent of the total amount of compensation that was insufficient to arrange for an alternative means of livelihoods. There is also an issue of arable land in the hills. For example, due to the lack of irrigation facilities, people of a village called G. Kholep under the Saitu block are unable to cultivate their agricultural fields in recent years

consecutively. Most of the farmers have left their paddy fields uncultivated for a long period, while some of them have converted their fields into horticultural farms in recent times. Moreover, villages situated in a semi-urban area do not possess enough land for practising terrace or shifting cultivation.

Business Establishments:

Business establishments or enterprises act as one of the main sources of livelihood in the state. People depend more on finished products and commodities irrespective of their socio-economic status due to globalisation and industrial development. The enterprises include business ventures such as manufacturing, wholesale, retailers, and others. Handloom, handicraft, and jewellery are considered manufacturing enterprises. Other enterprises include resorts, hostels, tea-hotels, ice-cream shops, grocery shops, juice shops, embroidery and tailoring, computer works, motor workshop tractor, auto-rickshaw services, and rice mills. The number of employees is used for measuring the size of enterprises, excluding the employer or entrepreneur. When it comes to employees, most of the enterprises hire only one employee, while some are self-managed by the entrepreneur itself. Enterprises having more than two employees are still lacking in the state. Business establishments and their characteristics are shown in Table 2.

Table 2: Distribution (%) of individuals having business enterprises by characteristics and hills and valleys of Manipur

Characteristics		*Hills*	*Valleys*	*Total*
		% (No.)	*% (No.)*	*% (No.)*
Own personal business set-up	Yes	43.3 (52)	44.2 (53)	43.8 (105)
	No	56.7 (68)	55.8 (67)	56.3 (135)
	Total	**100.0 (120)**	**100.0 (120)**	**100.0 (240)**
Business Sectors	Manufacture	9.6 (5)	5.7 (3)	7.6 (8)
	Wholesale	0.0 (0)	1.9 (1)	1.0 (1)
	Retailer	57.7 (30)	50.9 (27)	54.3 (57)
	Others	32.7 (17)	41.5 (22)	37.1 (39)
	Total	**100.0 (52)**	**100.0 (53)**	**100.0 (105)**

No of employees	Only 1	80.8 (42)	60.4 (32)	70.5 (74)
	2 to 5	19.2 (10)	35.8 (19)	27.6 (29)
	6 and above	0.0 (0)	3.8 (2)	1.9 (2)
	Total	**100.0 (52)**	**100.0 (53)**	**100.0 (105)**
Is it meets expenditures	Yes	26.9 (14)	34.0 (18)	30.5 (32)
	No	7.7 (4)	3.8 (2)	5.7 (6)
	To some extend	65.4 (34)	62.3 (33)	63.8 (67)
	Total	**100.0 (52)**	**100.0 (53)**	**100.0 (105)**
Main requirement for extension	Avail loan	57.7 (30)	56.6 (30)	57.1 (60)
	Skilled man power	13.5 (7)	7.5 (4)	10.5 (11)
	Market promotion	28.8 (15)	30.2 (16)	29.5 (31)
	Others	0.0 (0)	5.7 (3)	2.9 (3)
	Total	**100.0 (52)**	**100.0 (53)**	**100.0 (105)**

Note : Figures in parentheses are actual numbers.

Source : Primary field survey

The average monthly income of available enterprises works out to Rs. 14,414 in the hills and Rs. 22,813 in the valleys. Among the entrepreneurs, only 31 percent can meet their household expenditure, but the majority of them to some extent only. The highest requirement for business expansion is to avail of loans from financial institutions. Entrepreneurs require loans, skilled persons, and market opportunities to sustain and promote their enterprises on a larger scale. Some of the financial institutions in the state include commercial banks, microfinance institutions, NGOs/SHGs, and individuals. Commercial banks are the largest available financial institutions that provide loan facilities such as personal loans, farmer loans, housing loans, educational loans, and others. However, the majority i.e. 84 percent of individuals in the hills and 71 percent in the valleys have not availed of any type of loans from commercial banks. It is primarily due to the difficulties involved in the process, lack of knowledge, inability to produce required documents, and a few others who do not require loans. Besides, the far-off location of commercial banks is one of the main factors responsible for people not accessing facilities. Only a few people who live in urban and semi-urban areas have availed of vehicle or motor loans

in both the hills and valleys. This has helped them run taxi services and give up previous occupations such as agricultural or daily labourers. In the valleys, better accessibility due to closer proximity to commercial banks has helped a larger number of people avail of loans, as compared to those from the hills. However, there are individuals (local money lenders) who offer loans involving an easier process. But, such individuals charge a high interest rate, as their business is to maximise profit. It hampers low-income groups such as farmers, labourers, and small business venturers.

People's livelihood status is mainly determined by their income, which increases when they have access to good sources, such as business ventures and investment opportunities. In the state, business ventures require financial capital to start and sustain business from financial institutions. Locational distance, lack of awareness, and lack of trust on the part of bankers have deprived people of availing bank facilities. Consequently, entrepreneurs are faced with various challenges such as inadequate financial capital, marketing strategies, uncertainties, and business changes.

Implications of Infrastructure on Livelihoods

Infrastructure is one of the contributing factors of livelihoods development and hence its better accessibility has a positive implication for livelihood conditions. For example, access to the road transport system can help farmers transport their agricultural products to the market. This encourages farmers towards more production and thereby raising their income and promotes their living standard. However, unequal access to infrastructure has resulted in disparities in the livelihood conditions among the people living in the hills and valleys.

Transportation and Livelihoods:

A good road transportation system enhances people’s livelihood conditions. It includes surfaced road conditions, safe and regulated service, reasonable fare, and regular frequency of vehicle plying. It is relatively better in the valleys when compared to the hills. In the hills, the poor road condition lowers the frequency of passenger vehicles and raises traveling costs. It hinders people from reach the market

to sell their agricultural and other produces such as handloom and handicraft. Besides rough topography, the government's apathy towards construction and maintenance of road infrastructure is the primary disadvantage faced by the people in accessing a good transport system. However, rough topography and the low density of the population of the hills should not always be an excuse for the government for failing to implement transportation development schemes. The accessibility level of the road transport system by average agriculture production (Kg) is presented in Table 3.

Table 3: Distribution (%) of individuals' accessibility level of the road transport system and their average annual agriculture production (Kg) in Manipur

Road Transport System	*Hills*		*Valleys*		*Total*	
	NAW %	*AAP(Kg)*	*NAW %*	*AAP (Kg)*	*NAW %*	*AAP(Kg)*
Accessible	90.0 (63)	2332.1	100.0 (54)	3046.0	94.4 (117)	2661.6
Less accessible	10.0 (7)	1728.6	0.0 (0)	0.0	5.6 (7)	1728.6
Total	**100.0 (70)**		**100.0 (54)**		**100.0 (124)**	

Notes : Number of agricultural workers (NAW) and Average Agricultural Product (AAP)

Source : Primary field survey

Agricultural workers who have greater access to transportation facilities also have higher annual production. The road transportation helps them transport agricultural products to the market and transport agricultural inputs like fertilizers and high-yielding variety seeds. In the hills, farmers face challenges of lack of adequate transportation facilities and far-off marketplace. The use of tractors for ploughing fields is lacking in terrace cultivation due to improper road connectivity between the villages and agricultural lands. This further affects the sowing of cash crops on a large scale during the post-paddy harvest. In both the areas, the amount of agricultural production has fluctuated during the last five years due to a higher

dependence on monsoon and lack of irrigation facilities and other agricultural inputs. Its production is unable to meet the demand of an increasing population. Most of the farmers could produce only for mere sustenance and sometimes what they produce is even to meet their household consumption. In this condition, the sustainability of agricultural production is still uncertain in the state.

High transportation costs and less movement of vehicles primarily hamper agricultural products from reaching the market on time. It hinders the improvement of livelihood conditions. The underdeveloped transportation system in the hills discourages most of the farmers to cultivate and produce marketable cash crops especially perishable vegetables, on a large scale. On the contrary, valley farmers have better access to a good road transportation system that encourages them to produce cash crops and other products in larger quantities for the market.

Communications and Livelihoods:

People require access to a good communication system for information transmission to family members, relatives, business partners, co-workers, and clients and information gathering on employment opportunities and market conditions for their social and economic development. Telecommunication is primarily used for social connectivity such as connecting friends, family, and relatives as its share in first preference are largest in the state. It helps promote day-to-day economic activities in various ways through connecting business partners and co-workers and for getting information related to employment opportunities and market conditions. The use of it for livelihood and economic activities is poorer in the hills, as compared to the valleys. In the first preference, the valleys accounts for a higher share in economic activities such as connecting business partners and co-workers at 21 percent than the hills at 18 percent (Table 4). Similar is the situation for market conditions and employment opportunities.

Table 4: Distribution (%) of individuals' preferential order by use of telecommunication in Manipur

Preferential order	*News & employment*	*Weather forecasting*	*Market conditions*	*Family, friends & relatives*	*Business partners and Co-workers*	*Total*
	% (No)	*% (No)*	*% (No)*	*% (No)*	*% (No)*	*% (No)*
First	5.0 (6)	0.0 (0)	0.8 (1)	75.8 (91)	18.3 (22)	100 (120)
Second	24.2 (29)	1.7 (2)	26.7 (32)	16.7 (20)	30.8 (37)	100 (120)
Third	24.2 (29)	10.0 (12)	38.3 (46)	6.7 (8)	20.8 (25)	100 (120)
Fourth	30.8 (37)	26.7 (32)	28.3 (34)	0.8 (1)	13.3 (16)	100 (120)
Fifth	15.8 (19)	61.7 (74)	5.8 (7)	0.0 (0)	16.7 (20)	100 (120)
Hills Total	**100 (120)**	**100 (120)**	**100 (120)**	**100 (120)**	**100 (120)**	
First	6.7 (8)	0.0 (0)	3.3 (4)	69.2 (83)	20.8 (25)	100 (120)
Second	24.2 (29)	4.2 (5)	30.8 (37)	15.0 (18)	25.8 (31)	100 (120)
Third	24.2 (29)	5.0 (6)	35.8 (43)	12.5 (15)	22.5 (27)	100 (120)
Fourth	37.5 (45)	18.3 (22)	26.7 (32)	2.5 (3)	15.0 (18)	100 (120)
Fifth	7.5 (9)	72.5 (87)	3.3 (4)	0.8 (1)	15.8 (19)	100 (120)
Valleys Total	**100 (120)**	**100 (120)**	**100 (120)**	**100 (120)**	**100 (120)**	

Note : Figures in parentheses are actual numbers.

Source : Primary field survey

People living in poorer telecommunication network areas have been deprived of accessing the information on market conditions to sell their products and employment opportunities (Table 4). They lack decent living conditions and are also often ignored by media that fail to draw the attention of the government. As a result, the livelihood challenges of people living in such areas are not properly addressed mainly due to their geographical isolation. Therefore, their potential basic livelihood opportunities are deprived.

Electricity and Livelihoods:

Electricity is a primary requirement for domestic and commercial use. Its domestic purpose includes lighting, charging of electronic devices, and others. It reduces domestic manual works through the use of washing machines, electric

cookers/ovens, and water pumping machines. It saves time and uses it for other economically productive work. The use of it for reducing manual works is prominent in the valleys. Its commercial purpose includes carpentry works, motor-workshop, shops, computer works, jewellery, blacksmith, ice-cream making, and poultry farming. The majority of people in the valleys use electricity for commercial purposes as well as for reducing their manual works that comprise 72 percent, as compared to that of the hills at 39 percent. The use of electric energy for commercial purposes in the valleys is higher due to its better availability. People tend to use more of it for commercial purposes when the supply of electricity is more regular. Usage of it promotes people's livelihood conditions and helps them in their daily economic activities. Electric energy serves its purpose better if the supply of it is highly accessible (Table 5).

Table 5: Distribution (%) of individuals' accessibility levels to electricity by purpose in the Hills and Valleys

Electricity access	*The main purpose of electricity*								
	Hills			*Valleys*			*Hills and Valleys*		
	Domestic	Domestic & commercial	Total	Domestic	Domestic & commercial	Total	Domestic	Domestic & commercial	Total
	% (No.)	*% (No.)*	*% (No.)*	*% (No.)*	*% (No.)*	*% (No.)*	*% (No.)*	*% (No.)*	*% (No.)*
Highly accessible	84.5 (93)	100.0 (10)	85.8 (103)	94.5 (103)	100.0 (11)	95.0 (114)	89.5 (196)	100.0 (21)	90.4 (217)
Somewhat accessible	15.5 (17)	0.0 (0)	14.2 (17)	5.5 (6)	0.0 (0)	5.0 (6)	10.5 (23)	0.0 (0)	9.6 (23)
Total	**100.0 (110)**	**100.0 (10)**	**100.0 (120)**	**100.0 (109)**	**100.0 (11)**	**100.0 (120)**	**100.0 (219)**	**100.0 (21)**	**100.0 (240)**

Note : Figures in parentheses are actual numbers.

Source : Primary field survey

Electricity is used for pumping water into agriculture fields. Water pumping machines are mainly used for pumping water from streams and small rivers to

elevated fields during dry seasons. It facilitates fewer terrace cultivation areas in the hills due to distant electricity connections. The usage of it benefits valley farmers due to their permanent agriculture wetlands with proximity to electricity connections. It enhances agricultural production through agriculture-based secondary livelihood activities. People sustain their agricultural activities and raise income out of it. Electricity provides an equal environment in terms of comfort and convenience for people in the hills nowadays like then in the valleys. Its regular availability saves time and energy for household activities such as cooking, grinding, and fetching water. It minimises the use of firewood and charcoal that pollute the environment and emit hazardous smoke affecting the health of persons who usually cook, especially women. Moreover, service sectors like BPOs in the urban areas and workers like artisans, weavers, tailors, and craftsmen can work at night to increase production.

Discussion

Based on primary field data, areas with improved infrastructure access experience improved livelihood conditions. The annual agricultural production and monthly income of business set-ups in the hills are lower, as compared to the valleys. It demands an equitable establishment and distribution of infrastructure in both the areas for equitable improvement of livelihood conditions and inclusive growth. Anderson (2012) observes that when a particular infrastructure is located in a place, that place becomes suitable for economic activity and accessible for other economic activity to interact. However, in India, the distribution of infrastructures is solely based on the population that affects especially hills and the tribal areas, where the population is sparsely distributed. In Manipur, people in the hills are tribal communities and are highly dependent on agriculture and forest products.

Population pressure on agricultural lands such as permanent, terrace, and shifting cultivation in Manipur is ever rising. The pressure is greater on the valley's permanent agricultural lands. In the hills, permanent and terrace cultivation depends on the monsoon for irrigation. The shifting cultivation system has limitations in terms of productivity, environment, and cost of production. The yield of rice production has declined over the years in the hills, where shifting cultivation is predominant, it is lower by almost one-third of the yield in the valleys, where only

permanent cultivation is practiced (Marchang, 2017). In the study area, 50 percent of the agriculture workers produce food grains sufficient for their sustenance and only a few of them produce surplus food grains for the market. It is primarily caused by the lack of infrastructural facilities such as irrigation, transport, fertilisers, and tractors. This further affects the cultivation of cash crops and other horticultural crops, which highly depend on proper irrigation and transportation facilities. In Manipur, perishable horticultural products alone contribute to heavy losses after harvest, as 75 percent of growers sells their products to the local markets (Meetei, Devi and Singh, 2015). Orange cultivation is one of the prominent practices in the Tamenglong district of the hills, where the frequency of vehicle plying is the least among the district headquarters of the state. Cash crop cultivation is widely practised in both areas. Despite the sufficient availability of cultivable land in the hills, the annual average income of the valleys is much higher, as compared to the hills. It shows that good transport connectivity encourages people of the state to cultivate cash crops.

Over the years, dependence on agriculture has diminished due to unproductive practices of shifting cultivation in the hills, landlessness in the valleys, the advancement of education, and skill-based employment. There is a gradual shift observed in the livelihood means from agriculture to other non-agricultural activities such as small business enterprises. At the same time, there is an increase in rural to urban migration, as various infrastructures are easier to access that can improve small business set-ups. In India, educated rural people are more prone to migrating towards urban areas in search of better livelihood opportunities (Kumari, 2014). Similarly, in Manipur, skilled and literate people are bound to work in metro cities where employment opportunities are abundant. Therefore, the study suggests the need for the establishment and equitable distribution of infrastructure, based mainly on the size of geographical area, not merely based on the population size.

Conclusion

Adequate availability and access to infrastructure have significant implications for enhancing livelihood conditions in both hills and valleys of Manipur. However, most of the rural connectivity roads are left unmaintained and unsurfaced. Besides, the government MST buses are not sufficient, particularly in the hills. This has resulted

in a higher cost of transportation that affects the livelihood conditions of people. An insufficient supply of electricity affects manufacturing sectors such as computer and carpentry works, as well as other domestic uses. Additionally, unreliable telecommunication networks isolate people living in remote areas in the hills from better livelihood opportunities and other social and economic activities.

In the state, livelihood activities such as agriculture and business establishments are facing challenges in terms of production, income, and sustainability. Irrigation facilities and the use of modern technologies are still lacking which can improve the production of agriculture and allied activities. Cash crops are cultivated on permanent agricultural land located in the valleys, where transportation infrastructure is more readily available, leading to a higher level of production in comparison to the hills. The limited access to financial institutions has had a considerable impact on the viability of businesses and their growth. Consequently, inadequate and underdeveloped infrastructure is predominantly responsible for the impoverished living conditions of the people. The study suggests an adequate and proper implementation of infrastructural development programmes to improve the livelihood conditions of people in the state. The state government and other stakeholders should take up developmental interventions appropriately to serve the purpose. For proper implementation of infrastructural development works, it is recommended to strengthen the community-based organisations as third-party inspection teams to cross-check with reports given by the inspection team of the government departments.

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