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INFRASTRUCTURE LED LIVELIHOOD: A COMPARATIVE ANALYSIS OF HILL AND VALLEY IN MANIPUR

T Thangjahao Haokip[1] and Marchang Reimeingam[2]

Abstract

Adequate availability and easy access to infrastructures have positive implications for people's livelihood conditions. The study includes economic infrastructures such as road transportation, communication, and electricity. It adopts a multi-stage sampling technique. Based on the availability of infrastructures, three districts each were drawn from the hill and valley of Manipur. Better access to road transportation in the valley has resulted in the production of a larger quantity of agricultural products when compared to the hill, where available roads were mostly un-surfaced. Unreliable telecommunication services in remote areas of the hill isolated the people and were unable to draw the government's attention. In the valley, usage of electricity was higher for commercial purposes due to the regularity of its supply that promotes their livelihood conditions. Consequently, the average income from the livelihood activities of the hill was lower than the valley. Therefore, adequate availability of infrastructure is needed for the sustainability of livelihood conditions.

Keywords: infrastructure, livelihood, hill, valley, accessibility

Introduction

Good infrastructural status leads to a positive change in the conditions of the livelihood of people. Its contribution depends on how far it is accessible in terms of proximity and affordability by the users. Infrastructures are broadly classified into economic and social infrastructure. The present paper focuses on the economic infrastructures such as road transportation, communication, and electricity. Livelihood refers to the income generation activities such as agriculture and allied activities and business establishments that support people's well-being and standard of living. People tend to settle down where infrastructure facilities are easily accessible for their social and economic development. However, in India, the distribution of infrastructure largely depends on the size of the population. Thus, the areas where the population is sparsely distributed especially hill, tribal and rural areas are affected. Manipur is topographically divided into two main distinct land features namely hill and valley. As per the Directorate of Economics and Statistics (2017), 90 per cent of its total geographical area is covered by the hill and the valley with 10 per cent. On a contrary, the smaller area of the valley has a higher population with 59 per cent in 2011. This topographical distinction exists as a disparity line of socio-economic and political conditions. The socio-economic conditions such as income, occupation, and living standards of the people in the valley area appear better than the people in the hill area.

A livelihood activity is more productive, sustainable, and dependable for the people when it is adequately supported by economic infrastructures. The success of livelihood support strategies is strongly

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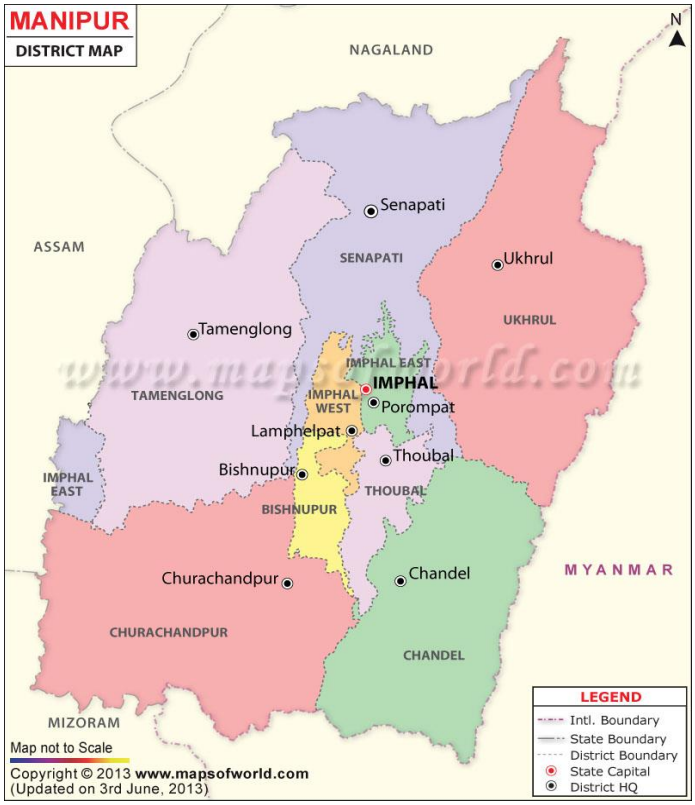
linked with successful efforts of the revitalisation of local infrastructure (Goovaerts, Gasser, and Inbal, 2005). A good transport system is a necessary condition for the development of agriculture. It makes possible the timely availability of agricultural inputs to the farms and timely marketing of produce, especially perishable products (Lokesha and Mahesha, 2017). India lacks major support for the manufacturing sector due to a lack of infrastructures, such as train and road networks, improvised communication systems, and electricity availability (Chitkara and Nagpal, 2017). Nayak (1999) stated that infrastructure is multidimensional, multipurpose, and is accepted as a complementary sector and a boom to other sectors of the economy. Insufficient and slow development of it depends on how well public finance governance is. 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 reach the status of a developed economy due to government-led infrastructure (Dash, 2017). The Government of India, since the eleventh Five Year Plan, took a new emphasis on inclusive growth across categories of the population, including regional categories (Planning Commission, 2008). However, regional imbalances are found in various sectors especially in the infrastructure sector. In Manipur, major infrastructures were mostly located in valley districts and that results in a huge disparity between hill and valley in all key indicators of development (Ziipao, 2019). Infrastructure is a contributing factor of livelihood development and its adequate availability has a positive impact on the livelihood conditions of the people. However, unequal distribution of it hinders inclusive development in the state. Therefore, the present study focuses on infrastructure-led livelihood conditions in Manipur. Its objective is to examine and bring out the disparities and the challenges of availability, accessibility, and the resultant of infrastructures between the two areas to understand how infrastructures trigger livelihood conditions.

Methodology and Data Source

The study is based on primary field data collected from the state of Manipur. The state has nine districts as per the Directorate of Economics and Statistics (2016 and 2017). The study adopts a multi-stage sampling technique. Firstly, the state is grouped into two clusters namely hill and valley areas and then six districts are drawn for the study. These six districts (three districts each from the hill and valley areas) were selected based on the availability of infrastructures such as road transport, post office, electricity in terms of population served, and geographical area coverage, categorised as best, medium, and poorest. The selected three districts from the hill area are Churachandpur, Tamenglong, and Senapati; and the selected three districts from the valley include Imphal West, Thoubal, and Bishnupur. Secondly, using the same criteria of district selection, 12 development blocks were drawn from these 6 districts. Two blocks each having the best and poorest available infrastructure in each district was selected randomly. 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. Additionally, one member of each village/ward authority (other than an individual selected earlier in the sample) was selected to collect information at the village/ward level. Thus, the total sample population consisted of 240 individuals (120 each in the hill and valley) and 24 members of village/ward authority.

Chart 1: Map of Districts in Manipur



Source: www.mapsofworld.com

The Primary data was collected from June to September 2019. The reference period of the present study is five years preceding the date of the field survey. The period is taken 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 is one year for variables related to health conditions and income to provide accurate and more reliable information by the respondents. Data was collected using a semi-structured questionnaire, personal interviews, and unstructured observation methods. Respondents to the personal interview include i) individual respondents and 2) village/ward level respondents.

Using the primary data, the present study attempts to explore infrastructural conditions and their implications on livelihood conditions in the state. The infrastructural conditions are measured in terms of their availability, accessibility, affordability, and satisfactory levels, whereas livelihood conditions are measured in terms of people's occupation, monthly income, and income from agricultural production, business establishments, and secondary livelihood activities. The study employs simple statistical methods like percentage distribution and average. To cross-examine the relationship between two or more variables, the data was cross-tabulated. Subsequently, the collected information was analysed and interpreted by comparing the hill and valley areas to draw inferences.

Infrastructural Conditions in Manipur

Road Transportation

Road transportation is the main mode of the transport system in Manipur. It is the most widely-used transport system that connects every nook and corner of the state. The present study includes road conditions, frequency of vehicle plying, affordability, and ownership of public and private transport systems. The available road transportation conditions determine the accessibility and satisfaction levels of people of it. Road condition depends on the types of roads 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 unsurfaced roads. Unsurfaced roads are mostly for seasonal road transportation, wherein vehicles are unable to ply during rainy seasons. The total length of the NH and SH of Manipur was 1,630 km and the total geographical area was 22,327 sq km. It was 1,210 km and 20,089 sq km in the hill districts and 420 km and 2,238 sq km in the valley districts (Directorate of Economics and Statistics, 2016 and2017). It was calculated that the road density per 0.06 km per every sq km of the geographical area was poorer in the hill than 0.19 km of the same in the valley.

The valley has better road conditions due to the higher availability of NH and SH that connect the capital city (Imphal) of the state. Most of the district roads and inter-village roads are 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. Subsequently, the valley has an adequate frequency of vehicles plying for passenger services with a reasonable fare of transportation. In the hill areas, the roads are unsurfaced and unmaintained, especially in remote areas, and hinder normally used passenger vehicles to ply. Henglep, a sub-divisional headquarters in the best district (Churachandpur) of the hill in terms of road infrastructure is connected with unsurfaced, steep, and seasonal motor-able roads. This results in the frequency of vehicles being thrice or less than thrice a week to reach the district headquarters with a high fare of Rs. 300 for 80 km. The available vehicles are trucks, shaktimans, and DI-407 for the transportation of both passengers as well as goods. Similarly, the un-surfaced road condition connects Purul and Koide villages from Maram junction of NH-39 in Senapati district. Only a private taxi called Tata-Sumo was plying three times a day for the transportation of passengers and goods between the two villages and district headquarters with a fare of Rs. 120 per head.

Inadequate availability of public transportation systems led to large transportation costs spent by the people to access health and education 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, which connects the capital city (Imphal) with some major towns. In the study areas, the buses were available from Imphal to Tamenglong and Noney in the hill and Moirang and Kakching in the valley. The fare in MST buses was 50 per cent lower than that of the private passenger vehicles. It benefits the people living in and around the routes, especially in terms of the cost of transportation. However, its shortage of supply was filled by individuals and corporations and resulted to fix a higher transportation cost. Consequently, private transporters monopolise the transportation system in the state that affects the affordability of fare for poor people in particular. Accessibility and satisfaction levels of people on road transportation depend on the condition of the road

such as surfaced, broadness, durability, timely maintenance, and regularity of vehicle plying for passengers. The valley people have better accessibility and a higher satisfaction level when compared to the people from the hill (Table 1).

Table 1: Distribution (%) of Individuals' Accessibility and Satisfactory Level of Infrastructural Facilities by Hill and Valley in Manipur

Infrastructures		***Hill***	***Valley***	***Total***
		% (No.)	***% (No.)***	***% (No.)***
Road Transportation				
Accessibility	Highly accessible	66.7 (80)	77.5 (93)	72.1 (173)
	Somewhat accessible	25.8 (31)	22.5 (27)	24.2 (58)
	Less accessible	7.5 (9)	0.0 (0)	3.8 (9)
	Total	**100.0 (120)**	**100.0 (120)**	**100.0 (240)**
Satisfactory levels	Satisfied	59.2 (71)	86.7 (104)	72.9 (175)
	Dissatisfied	40.8 (49)	13.3 (16)	27.1 (65)
	Total	**100.0 (120)**	**100.0 (120)**	**100.0 (240)**
Telecommunication				
Accessibility	Highly accessible	52.5 (63)	89.2 (107)	70.8 (170)
	Somewhat accessible	38.3 (46)	10.8 (13)	24.6 (59)
	Less accessible	9.2 (11)	0.0 (0)	4.6 (11)
	Total	**100 (120)**	**100 (120)**	**100.0 (240)**
Satisfactory levels	Satisfied	85.8 (103)	96.6 (116)	91.2 (219)
	Dissatisfied	14.2 (17)	3.4 (4)	8.8 (21)
	Total	**100 (120)**	**100 (120)**	**100.0 (240)**
Electricity				
Accessibility	Highly accessible	85.8 (103)	95.0 (114)	90.4 (217)
	Somewhat accessible	14.2 (17)	5.0 (6)	9.6 (23)
	Total	**100 (120)**	**100 (120)**	**100.0 (240**
Satisfactory levels	Satisfied	96.7 (116)	98.3 (118)	97.5 (234)
	Dissatisfied	3.3 (4)	1.7 (2)	2.5 (6)
	Total	**100 (120)**	**100 (120)**	**100.0 (240)**

Notes: Figures in the parentheses are numbers.
Fully satisfied + satisfied = Satisfied; and fully dissatisfied + dissatisfied = Dissatisfied.
Source: Primary field survey

The average distance between the localities and district headquarters works out to 32 km and the average fare works out to Rs. 89 in the hill areas, which are 9 km and Rs. 19 in the valley. Therefore, the cost of transportation per kilometre is approximately Rs. 3 in the hill and Rs. 2 in the valley. The poor condition of roads affects their efficient use and the cost of transportation that eventually affects the economic conditions in the hill. This further affects mobility and people to obtain their services for a long period.

Poor conditions of roads were mainly caused due to the improper implementation of road development programmes. The Pradhan Mantri Gram Sadak Yojana (PMGSY) is a rural road development scheme that was launched on 25th December 2000 to connect habitations. The road quality in the scheme

guideline includes surfacing, side drainage, cross drainage, and protection works or retaining walls wherever required (Planning Commission, 2008). The stated road qualities are unable to be fulfiled during implementation works. It was observed that the PMGSY roads in Purul and Tamenglong blocks in the hill and Kwashiphai in the Bishnupur district of the valley were unsurfaced. Koide village in Senapati district was surfaced with very low quality that even grasses had grown through it. Roads under the scheme in Henglep block in Churachandpur district were under construction. The Jawaharlal Nehru National Urban Renewal Mission (JnNURM) was a massive city-modernisation scheme. In Manipur, the scheme was launched on 23rd February 2012. However, the unsuitable road conditions of Imphal, the narrowness of the existing roads caused traffic congestion, and difficulty in negotiating the buses at road junctures for dropping or picking up passengers at many points caused problems (Hueiyen Lanpao, August 2012). Hence, unfortunately, the buses were not seen in the valley of Manipur during the fieldwork. The issues of slow execution and unsatisfactory results in road infrastructure projects in Manipur follow from the authorities who implement the projects, local politicians and bureaucrats, and underground groups (Downie, 2015). The long-drawn process in the creation of infrastructure was mainly due to law and order problems, poor governance, and importing raw materials from other states, which add to the heavy transportation cost (Ziipao, 2019). Thus, the unsatisfactory implementation of road development programmes and projects affects the road transport condition and impedes the development of the state.

Communication:

The whole world becomes smaller due to the fast development of the communication system. 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 communication to disseminate information. Among the ICT, the telecommunication device, mobile phones have been widely used by people for their social and economic development. Despite poor network availability, basic mobile phones are available in every household in the study areas. Thus, telecommunication has been included in this present paper due to its wider access by the people. It is one of the fastest-growing infrastructures in India. Its growth rate in terms of teledensity in the Northeast circle was 79 per cent against all India's 81 per cent as of October 2015. It has increased to 84 per cent and 92 per cent respectively as of January 2019 (TRAI, 2015 and 2019). Despite its faster growth and delivery of more reliable services for users over a while, there are large geographical areas where the coverage of telecommunication networks service is very poor particularly in hill areas.

People living in the villages in Henglep block went to a certain place where the network is available when they wanted to make a call. The unreliability of telecommunication services isolated the villagers from connecting with their friends, relatives, and other business partners for their social lives and economic activities. It affects the daily lives of people, especially in times of emergencies. In the valley, telecommunication network services are reliable and they shared 89 per cent of highly accessible people when compared to 53 per cent of the hill (Table 1). Access to good telecommunication services changes the lives of the people through the exchange of information that enriches livelihood in particular.

Its usage has a considerable contribution to various aspects of their daily lives. In the state, only people living in the valley and urban and semi-urban areas of the hill have good access to it.

Electricity:

The electricity power supply is a prerequisite for the modern world of work and daily lives due to fast-growing 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 hill areas, whereas in the valley it is pre-paid. Post-paid payments are further classified into monthly payments in the urban areas and quarterly or half-yearly lump-sum amounts through the village authority in the remote areas. Moreover, some villages such as Henglep, Tuilaphai, Koide, and Purul are electrified free of cost through BPL connection. Under this connection, the households paid a maintenance fee collected by the village authority. The collected amount ranges from Rs. 20 to Rs. 50 per month in the previous year. The amount fluctuates as it depends on the disconnections caused by natural calamities such as storms, falling of trees on main wires, and landslides. The average monthly electricity charge in the hill areas works out to Rs. 210, which is lower by more than twice the amount of Rs. 531 in the valley. The lump-sum payment and BPL connection of electricity charges in the hill was the main reason for lowering the amount.

Good access to electricity does not necessarily mean that all the people are uniformly satisfied with it. The satisfaction levels of people on electricity depend on their daily availability in terms of hours. According to the village authority and ward members, in the study area, electric current is available for 16-24 hours except in the villages/wards of Tamenglong district and Purul in Senapati district where it is available for 12-16 hours during the last five years. The people's satisfactory level of electricity supply in the valley area is more intense as compared to the hill (Table 1). People showed dissatisfaction due to the lack of maintenance of electricity services in the hill areas when disconnected by natural calamities. The valley people are unsatisfied as the electricity department continued to fail to fulfil their promise to provide 24 hours of electricity supply every day after installation of prepaid connection. Electricity supply is regular in the valley in terms of hours per day due to the installation of a pre-paid system for almost a decade. In the hill, it is regular for the past three to four years despite the non-installation of a pre-paid system. The better condition of it during the survey was mainly due to the significant initiatives taken by the Manipur State Power Distribution Company Limited (MSPDCL) since February 2014 under the World Bank-supported Technical Assistance (TA) and sufficient support from the state. As per Mittal, Saraswat, Gupta, and Gaba (2016), the MSPDCL had implemented the Restructured Accelerated Power Development and Reform Program (RAPDRP) Part A and B, the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY), and other state government schemes. It has improved the supply of power from 10 to 12 hours at District Headquarters to about 18 to 24 hours and from 6 to 8 hours to about 15 to 18 hours a day in the hill areas. Earlier, the performance of the power sector in Manipur was poor. Some of the villages were electrified only in recent times. Before electrification, people used candles, oil lamps, and traditional lamps for lighting that emitted unwanted smoke. The cost of an electricity connection was also cheaper than the cost of kerosene oil for household lighting. Its adequate availability has wide ranges of impact on the

living conditions of households as it makes daily lives easier by using machines. Therefore, its widespread exposure and access in the valley give people a greater advantage in its usage for livelihood enhancement before the hill people.

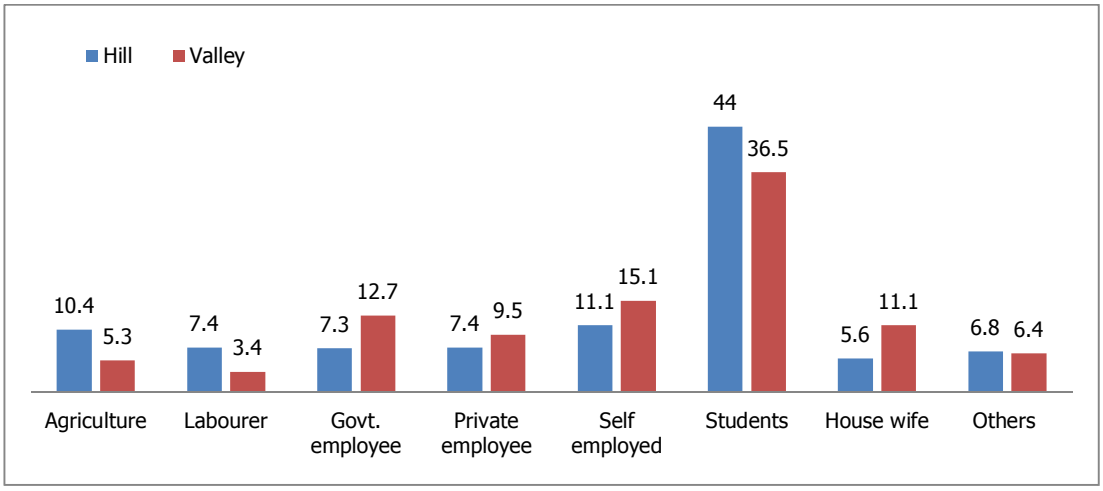
Livelihood Condition in Manipur

Manipur is predominantly an agrarian economy. It lacks large industries and that hinders economic development and employment opportunities. Small and traditional-based industries are prevalent. In the state, the major means of livelihood include agricultural and allied activities, business establishment or enterprises, employment in government and private services, and daily labour. The following section discusses the livelihood conditions and activities of the people.

Occupation and Income:

The nature of occupation differs from one person to another based on the available opportunity, interest, possessed skills, and professionalism. An occupation is the one in 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-age, infants and persons with disabilities, and workers. Workers are further classified based on their occupations. Agriculture workers are workers who cultivated their own land as well as that of the tenant. Daily labourers are those who engage in agricultural and non-agricultural works and received wage payments daily. Government employee refers to workers who received their pay from the central and state governments. Private employee refers to workers who received their pay from private companies, institutions, and NGOs. Self-employed refers to those working in their own business establishments. In the hill areas, self-employed and agricultural workers were the main occupations, followed by the daily labourer, private employees, and government employees (Chart 2). In the valley, self-employed, government employees, and private employees were recorded as the main occupation followed by agriculture workers and daily labourers.

Chart 2: Distribution (%) of the Individual's Main Occupations by Hill and Valley in Manipur



Source: Primary field survey

The income of a person or household indicates livelihood status. The household's monthly income includes annual agriculture products[3] and the income of all the family members. It ranges from Rs. 3,100 to Rs. 1,16,000 in the hill, whereas it was Rs. 9,000 to Rs. 1,80,000 in the valley. The average household monthly income in the hill (Rs. 34,638) was lesser than that of the valley (Rs. 48,306). Concurrently, the average household size in the hill (6.1 persons) was larger than in the valley (5.4 persons). Consequently, the average monthly per capita income was much lesser in the hill at Rs. 5,686 when compared to the valley's Rs. 8,863. Thus, there was a wide income disparity between the hill and valley people.

Agriculture and Allied Activities:

Agriculture and allied activities are one of the main occupations of the state. The workers could be divided into two, namely people who cultivated their own agricultural land and tenants who cultivated a rented land from landlords. The type of agricultural practice includes a permanent, terrace, and shifting cultivation. The permanent type of agriculture field is normally found in plain areas and owned by a person permanently. Terrace cultivation land is permanent in terms of ownership, however, normally practised in the hill slopes. It mostly depends on monsoon rain due to its higher altitude location where irrigation facility is difficult in most of the places. Shifting cultivation is neither permanent nor paid rent land that is cultivated by the farmer for a year or two. It is widely practised only in the hill areas. In the valley areas, all agricultural fields are permanent lands. In the hill areas, all three types of agricultural fields are prevalent.

[3] Total annual agriculture product amount in Rupees divided by 12 months for monthly income.

Table 2: Distribution (%) of households' agricultural features by hill and valley in Manipur

Particulars		Hill	Valley	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)	1.8 (1)	2.4 (3)
	More than 5 hectares	0.0 (0)	1.8 (1)	0.8 (1)
	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 the parentheses are numbers.
Source: Primary field survey

Paddy, being a staple food is widely cultivated in the state. It stood at the top with 73 per cent of main crop cultivation (Table 2). Most of the farmers in the valley cultivate vegetables and other cash crops after harvesting paddy. Some farmers cultivate paddy and vegetables at the same time, particularly in the hill areas under shifting cultivation. Despite the considerable dependence on agriculture, some farmers do not ensure self-sustenance and the majority of them are unable to produce a surplus marketable agricultural product. Only a few 16 per cent of the farmers have produced a marketable surplus in the state. The average annual agricultural production[4] of paddy works out to Rs. 32,961 in the hill, which is lower than Rs. 35,176 in the valley. Low agricultural production in the state causes due to

[4] 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.

the small size of agricultural land and lack of agricultural infrastructures such as irrigation facilities, ploughing tractors, and fertilisers. Most of the agriculturists hold an area of land of less than one hectare in both the hill and valley. Only 2 to 3 per cent of them have more than 3 hectares of agricultural land. Ownership of agricultural land does not ensure sufficient production.

People of the hill have a higher dependency on agriculture and forest products, however, the average annual agricultural production was lower than the valley. Valley cultivators were better facilitated by agricultural infrastructures as 95 per cent of them used tractors, 59 per cent of them have irrigation facility and 84 per cent of them used fertilisers when compared to the hill cultivators where 44 per cent of them used tractors, 37 per cent of them have irrigation facility and 13 per cent of them used fertilisers (Table 2). All these factors led to an increase in agricultural production in the valley. In the hill, the use of tractors was minimal due to the widespread practice of shifting cultivation and lack of feasibility to adopt it in most of the terrace cultivation areas due to the lack of proper roads to enter the field and rough topography. As a result, animals are mostly used for ploughing the fields. The rough topography and higher altitude location of terrace land are constrained to depend on monsoon rain.

Generally, the hill and tribal people largely depend on agriculture and forest products for their livelihood. However, some households do not have a piece of agricultural land in the hill areas. The reasons include submersion of agricultural land along with the villages (Geljang, Lamka block) due to the construction of a dam called the Khuga dam. The victims received only 50 per cent of the total amount of compensation and were insufficient to arrange an alternative means of livelihood. There was also an issue of arable land in the hill areas. For example, due to the lack of irrigation facilities, the people of a village called G. Kholep under the Saitu block were unable to cultivate their agricultural fields in recent years consecutively. Most of the farmers left their paddy fields uncultivated for a long period and some of them changed their fields into horticulture farms in recent time. Moreover, the villages that are situated in the semi-urban area do not have enough land for practising terraces or shifting cultivation.

Business Establishment:

Business establishments or enterprises acted as one of the main means of livelihood in the state. People depend more on finished products and commodities, irrespective of socio-economic status due to globalisation and industrial development. The enterprises include any business venture for earning profit. It covers manufacturing, wholesale, retailers and others. Handloom, handicraft and jewellery were considered to be manufacturing enterprises. Other enterprises include resort, hostel, tea-hotel, ice-cream shop, grocery shop, juice shop, embroidery and tailoring, computer works, motor workshop tractor, auto-rickshaw services, and rice mill. The number of employees is used for measuring the size of the enterprises, excluding the employer or entrepreneur. In terms of an employee, most of the enterprises have only one employee and some were self-managed by the entrepreneur itself. Enterprises having more than two employees were still lacking in the state. Business establishments and their characteristics are shown in Table 3.

Table 3: Distribution (%) of Individuals' Having Business Enterprises by Characteristics and Hill and Valley of Manipur

Characteristics		Hill	Valley	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)**
Sector of the business	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)**
Does it meet 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 numbers.
Source: Primary field survey

The average monthly income of the enterprises works out to Rs. 14,414 in the hill, which is lower than Rs. 22,813 in the valley. Among the entrepreneurs, only 31 per cent were able to meet their household expenditure, but the majority of them were able to meet the expenditure to some extent only. The highest requirement for business expansion was to avail loans from financial institutions. Entrepreneurs required loans, skilled persons, and market opportunities to sustain and promote their enterprises on a larger scale. Some of the available financial institutions were commercial banks, microfinance institutions, NGOs/SHGs, and individuals. Commercial banks were the largest available financial institution for availing loans in both hill and valley areas. Some of the loan facilities are personal loans, farmer loans, housing loans, education loans, and others. However, most people do not avail loans from it primarily due to the difficulties involved in the process, lack of knowledge, and inability to produce required documents. Besides, the far location of commercial banks was one of the main factors that deprived the people of accessing its facilities. Only a few people who live in urban and semi-urban areas have availed of vehicles or motor loans in both hill and valley. This helps them to run taxi services and left previous occupations such as agricultural or daily labourer. In the valley, better accessibility due to closer proximity of commercial banks resulted in having a higher percentage share of the person who

availed loans when compared to the hill. There were individuals (money lenders) who offer loans with an easier process. However, such individuals charge high-interest rates as their business is to maximise profit. It hampers low-income groups such as farmers, labourers, and small business ventures. The share of individuals who have taken loans from financial institutions is presented in Table 4.

Table 4: Distribution (%) of Individuals Who Access Commercial Banks for Loans in Manipur

Accessibility to Financial Institutions	Respondents who availed loans from commercial banks (Yes/No)								
	Hill			Valley			Total		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
	% (No)	% (No)	% (No)	% (No)	% (No)	% (No)	% (No)	% (No)	% (No)
Accessible	84.2 (16)	71.3 (72)	73.3 (88)	94.3 (33)	(77) 90.6	91.7 (110)	90.7 (49)	78.1 (145)	82.5 (198)
Less accessible	15.8 (3)	28.7 (29)	26.7 (32)	5.7 (2)	9.4 (8)	8.3 (10)	9.3 (5)	19.9 (37)	17.5 (42)
Total	100.0 (19)	100.0 (101)	100.0 (120)	100.0 (35)	100.0 (85)	100.0 (120)	100.0 (54)	100.0 (186)	100.0 (240)

Note : Figures in parentheses are numbers.

Source : Primary field survey

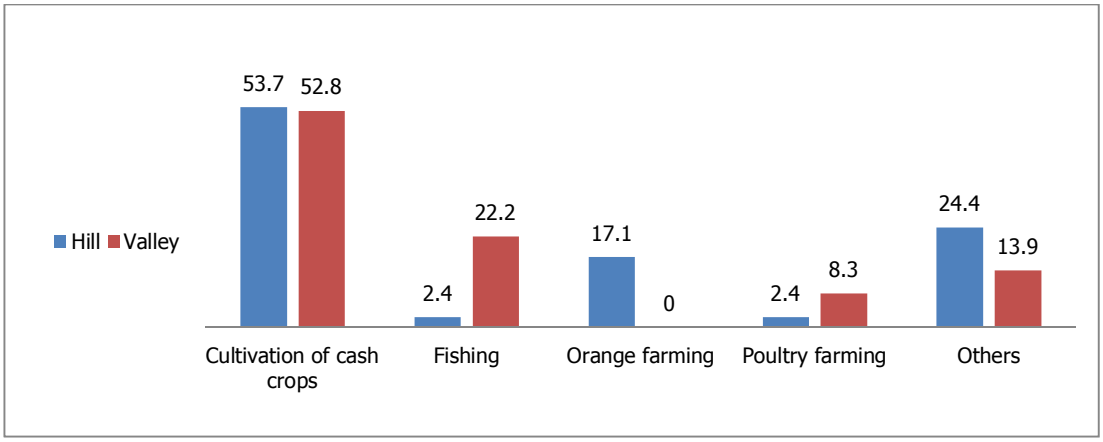
The livelihood status of the people is mainly determined by income. The income increases when people have good sources like business ventures and investment opportunities. In the state, business ventures require financial capital to start and sustain business from financial institutions. Far distant, lack of awareness of available bank facilities and lack of trust by bankers has deprived people of availing bank facilities. These hamper the extension of business establishments on a larger scale and the sustainability of their business. The unavailability of credit facilities is again an impediment to promoting micro-enterprises and other livelihood opportunities. Consequently, entrepreneurs faced various challenges such as inadequate financial capital, marketing strategy, uncertainties, and day-to-day business changes.

Secondary Livelihood Activities:

Some people have secondary livelihood activities apart from their main occupation. The secondary activity supplements income for the people who engaged in economic activity. It includes the cultivation of cash crops, fishing, farming, and others. Other activities are banana plantations, blacksmiths, carpentry, handicraft, handloom, spices production, and timber work. Paddy shared about 72 per cent of the total cropped area in the state (Directorate of Environment, 2015). It is mostly cultivated and is considered the main crop in Manipur. People practice the cultivation of other cash crops as a secondary activity. Out of 120 persons each in the hill and valley, 34 per cent of the hill people engaged in secondary livelihood activities and 30 per cent of them engaged in secondary livelihood activities in the valley areas. The production from secondary activities is based on agricultural products and skill-based products such as handicrafts, handloom, and others. Among the secondary activities, the cultivation of cash crops stood at the top in both areas. The cash crop cultivation depends on its season of the crops. However, as a secondary activity, it is mostly cultivated after the harvesting of paddy. Orange cultivation is mostly found in Tamenglong and Senapati districts on the hill. Fishing is widely practised in Thanga village under the Moirang block at Loktak Lake in the valley. It is mostly practised by menfolk and sold to the market by

womenfolk. Some skill-based activities such as carpentry, blacksmith, handloom, and handicraft were also found among secondary activities as the works were done during off-seasons and leisure time. Chart 3 shows the significant shares of people who engaged in different types of secondary activities.

Chart 3: Distribution (%) of Persons Having Secondary Livelihood Activity by Its Types of Activities in Manipur



Source: Primary field survey

The average annual income from secondary activities works out to Rs. 37,707 in the hill, which is almost lesser than half of the valley's Rs. 70,694. It is higher in the valley mainly due to the cultivation of cash crops in permanent agricultural land, the use of modern technology, and better marketing facility with a lower cost of transportation to the market. It is lower in the hill areas due to the cultivation of cash crops in shifting cultivation land. The production also required a longer time and incurred a higher cost of transportation to reach the market. Indeed, income from secondary activity adds to the income of the household and promotes the livelihood condition of the people.

The Implications of Infrastructure on Livelihood

Infrastructure, being one of the contributing factors of livelihood development, its better accessibility has a positive implication on livelihood conditions. For example, easy access to the road transport system among farmers can transport their agricultural products to the market. That encourages the farmers to produce a larger amount of production and consequently raises their income. An increase in income promotes the living standard of the people. In Manipur, unequal access to infrastructure between hill and valley has resulted in disparity in terms of the livelihood conditions among the people.

Transportation and Livelihood:

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. The roads are relatively better in the valley as compared to the hill. In the hill, its poor road condition lowers the frequency of passenger vehicles and raises travelling costs. It hinders the people to reach a market to sell their agricultural and other produces, such as handloom and handicraft. Besides hilly and rough

topography, the government's apathy to construct and maintain road infrastructure was the primary disadvantage faced by the hill people to access a good transport system. However, rough topography and low density of the population of the hill should not always be an excuse of the government in failing to implement transportation development schemes. The accessibility level of the road transport system by average agriculture production (Kg) in Manipur is presented in Table 5.

Table 5: Distribution (%) of individuals' accessibility level of the road transport system by agricultural workers and their average agriculture production (Kg) in Manipur

Road Transport System	***Hill***		***Valley***		***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)**	

*Note*s: * Number of agricultural workers (NAW) includes both own agricultural workers and tenants,
^ Average Agriculture Product (AAP) and
Source: Primary field survey

People who have greater access to the transport facility also have a higher annual agriculture production. Farmers depend on road transport for transporting agricultural products to the market and transporting agricultural inputs like fertilisers and high-yielding variety seeds. In the hill area, farmers faced challenges like lack of adequate transportation facilities and far distances from the 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 areas, the amount of agricultural production fluctuates during the last five years due to a higher dependence on monsoon, lack of irrigation facilities, and other agricultural inputs. Its production is unable to meet the demand of the increasing population. Most of the farmers could produce only for mere sustenance and some of them were insufficient even for their own household's consumption. In this condition, the sustainability of agricultural production is still uncertain in the state.

Secondary livelihood activities in the state are mostly based on agricultural allied activities such as cash crop cultivation, orange and banana plantation. Among the cash crops, perishable vegetables are prevalent in the state. Besides, some people engaged in fishing, poultry farm, handicraft, and handloom. A good transport system has a positive impact on secondary activities as it does on agricultural activities. The prevalence of it determines people's engagement in secondary livelihood activities. People of a region who have better access to road transport facilities practice more secondary activities in comparison to people with lesser access to it. Among the people who were engaged in secondary activities, those who have access to better transport facilities have higher income from their production (Table 6).

Table 6: Distribution (%) of Individual's accessibility levels of the road transport system and average income from secondary activity in Manipur

Road Transport System	Secondary Livelihood Activities (SLA)					
	Hill		Valley		Total	
	% (No.)	(Rs)	% (No.)	(Rs)	% (No.)	(Rs)
Accessible	85.4 (35)	40,885.7	100.0 (36)	70,694.4	92.2 (71)	56,000.0
Less accessible	14.6 (6)	19,166.7			7.8 (6)	19,166.7
Total	**100.0 (41)**	**37707.3**	**100.0 (36)**	**70,694.4**	**100.0 (77)**	**53,129.9**

Notes: Number of persons who engage in secondary livelihood activities (No.) and their annual income (Rs.)

Source: Primary field survey

High transportation costs and less movement of the vehicle primarily hamper agriculture products to reach the market on time. In the hill area, it discourages most of the farmers to cultivate and produce marketable cash crops especially perishable vegetables on a large scale. Production from other activities such as poultry, timber, fishery, orange, and banana cultivation has a higher dependence on road transportation to reach market places. On the contrary, the people of the valley have better access to a good road transportation system that encourages them to produce cash crops and other productions in larger quantities for the market. In the hill areas, underdeveloped conditions of transportation systems discourage people to practice farm (cash cropped) based activities on large scale despite the availability of adequate land that in turn hinders the improvement of their livelihood condition. A carpenter in Henglep village stated that he is unable to sell his finished furniture to the market due to a poor road transport system. The village is connected with an unsurfaced road and less frequency of vehicle plying. People mostly depend on passenger vehicles for the transportation of their production.

Communication and Livelihood:

People require access to a communication system for information transmission to family members, relatives, business partners, co-workers, clients, and information gathering on employment opportunities and market conditions for their social and economic development. Telecommunication is primarily used for social connectivity with friends, family, and relatives as its share in first preference is largest in the state. It has helped to 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 hill as compared to the valley. In the first preference, the valley has higher shares on economic activities, such as connecting business partners and co-workers with 21 per cent compared to the hill's 18 per cent (Table 7). Similar was the situation for market conditions and employment opportunities. Table 7 shows the use of it for various purposes in both the hill and the valley of Manipur.

Table 7: 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)
Hill 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)
Valley Total	**100 (120)**	**100 (120)**	**100 (120)**	**100 (120)**	**100 (120)**	

Note: Figures in parentheses are 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. They lacked decent living conditions and are also often ignored by media that fails to draw attention from the government. Subsequently, 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 Livelihood:

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 allows the use of saved time for other economically-productive work. Its commercial purpose includes carpentry works, motor-workshops, shops, computer works, jewellery, blacksmith, ice-cream making and poultry farming. The majority of people in the valley use electricity for commercial work as well as to reduce their manual work, accounts for 72 per cent, which is as compared to that of the hill area's 39 per cent. Electric energy is used higher for commercial purposes in the valley due to its better availability. People tend to use more of it for commercial purposes if the supply of electricity is more regular. Usage of it promotes the people's livelihood conditions and helps them in their day-to-day economic activities. In both the hill and valley areas, electricity energy served its purpose better if the supply of it was highly accessible (Table 8).

Table 8: Distribution (%) of Individuals' Accessibility to Electricity by Purpose in Manipur

Electricity access	The main purpose of electricity								
	Hill			Valley			Hill and Valley		
	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 numbers.

Source : Primary field survey

Electricity is used for pumping water from the streams and small rivers to agriculture fields, especially the elevated fields during dry seasons. The usage of pumping machines benefited valley farmers due to their permanent agriculture wetland and proximity to electricity connections. It enhances agricultural production and raises income out of it. Electricity provides an equal environment in terms of comfort and convenience for the people in the hill areas than in the valley areas. 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 pollutes the environment and emits hazardous smoke affecting the health of a person who usually cooks, especially the 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

This paper is based on primary field data and studies the comparative implications of infrastructure in livelihood conditions between the hill and valley people of Manipur. The annual agricultural production and monthly income of business set-ups in the hill are lower as compared to the valley. It demands an equitable establishment and distribution of infrastructure in both the areas for equitable improvement of livelihood conditions and inclusive growth. Anderson (2012) stated that when a particular infrastructure is located in a place, that place becomes suitable for economic activity and accessible for other economic activities to interact. However, in India, the distributions of infrastructures are solely based on the population and that affects especially the hill and the tribal areas where the population is sparsely distributed. The hill people of Manipur who were largely tribal communities highly depended on agriculture and forest products from their large geographical territory.

Population pressure on agricultural lands such as permanent, terrace, and shifting cultivation in Manipur is ever rising. The pressure is greater in the valley's permanent agricultural lands. In hill areas, permanent and terrace cultivations depend 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 Manipur. In the hill areas, where shifting cultivation is predominant, the yield of rice is lower by almost one-third of the yield in the valley, where only permanent cultivation is practised (Marchang, 2017). In the study area among the agriculture workers, 50 per cent of them

produce an output for sustenance and a large share of these workers produce insufficient production and only a few of them produced surplus output for the market. Production of the less marketable surplus has been caused by the lack of infrastructural facilities such as irrigation, transport, fertilisers, and tractors. People of the state could no longer depend merely on agricultural produces for their livelihood. However, such secondary activities are mainly based on agriculture and allied activities, wherein a good transportation facility is highly required. In Manipur, lack of connectivity between horticultural farms and market places affected the heavy loss of its perishable products, a majority of 75 per cent of growers sold their products to the local markets and some 36 per cent of growers' products were picked by contract buyers from the farm directly (Meetei, Devi and Singh, 2015). Orange cultivation is one of the prominent practices in the Tamenglong district of the hill, however, the majority of growers sell their products in the local market due to poorer frequency of vehicle plying as compared to other district headquarters. Cash crop cultivation is widely practised in both areas. Despite the larger availability of cultivable land in the hill areas, the annual average income is much poorer as compared to the valley. It shows that good transport connectivity encourages the people of the state to cultivate cash crops.

Over the years, dependence on agriculture and forest products diminished due to unproductive practises of shifting cultivation in the hill, landlessness in the valley, the advancement of education, skill-based employment, growth of non-agricultural activities, and others. There is a gradual shift of livelihood means from agriculture to other non-agricultural activities, such as small business enterprises. Consequently, rural to urban migration emerges in urban centres where various infrastructures were easier to access that can better flourish small business set-ups. In India, educated rural people are more prone to migrate towards urban areas to improve their standard of living and 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 distribution of equitable infrastructure based mainly on the size of geographical areas, but not merely based on the population size.

The interdependence of infrastructures is found very significant. Development can only take place when basic infrastructures are adequately available. An adequate supply of electricity is conducive for industrial development as its energy is a primary requirement for industries. However, its good access alone is unable to improve livelihood conditions sufficiently due to the underdeveloped condition of the road transport system and poor telecommunication networks in the state.

Conclusion

The development of livelihood conditions requires good availability of both economic and social infrastructures such as road transport, communication, electricity, and healthcare centres. Improper implementation of infrastructural development schemes is one of the factors for the under-developed status of available infrastructures. Most of the district roads are left unmaintained, village roads and PMGSY roads are unsurfaced and government public transport system MST buses are not sufficient, particularly in the hill areas. The condition results in a higher cost of transportation that affects the livelihood condition of the people. In the hill areas, unreliable telecommunication networks isolate some hill areas from livelihood opportunities.

In the state, livelihood activities such as agriculture, business establishments, and other secondary activities are facing challenges in terms of production, income, and sustainability. Irrigation facilities and the use of modern technologies were still lacking to improve the production of agriculture and allied activities. In the valley, the cultivation of cash crops practised in permanent agricultural land with better access to transportation facilities resulted in a larger scale of its production as compared to the hill area. Lack of access to financial institutions largely affected the extension and sustainability of business establishments. As a result, only micro and small-scale enterprises are mostly found in the state. Consequently, the average production and income from these livelihood activities are found to be poorer in the hill area when compared to the valley area. Inadequacy, poor and underdeveloped infrastructure, which is a primary contributing factor to livelihood development fails to enhance the livelihood condition of the people, especially in the hills. The study suggests adequate availability and proper implementation of infrastructural development programmes to enhance the livelihood condition of the 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 community-based organisations as third-party inspection teams to cross-check with reports given by government departments.

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