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RESEARCH ARTICLE

Natural Resources Potentials and Socio-Economic Status in the Indian Himalayan Region

Vishwambhar Prasad Sati
Deptt. of Geography and Resource Management, Mizoram University, Aizawl-796004, India
E-mail: vpsati@mzu.edu.in

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ABSTRACT

The Indian Himalayan region is repository of abundance of natural resources such as water, land and forest. Varied landscapes – the valleys, mid-altitudes and the highlands comprise this region. Water potential, in the forms of glaciers, glacier-fed perennial rivers, highland lakes, springs and ground water is enormous and the whole Himalayan region is known as water tower. Economically viable forests from sub-tropical to temperate with high biodiversity characterise this region. These abundant natural resources are largely unused and as a result, economic status of the inhabitants is significantly low. Economy is mainly dependent on traditionally grown subsistence cereal crops with low output. Average Human Development Index is 0.561, people living below poverty line are 12.59 per cent, environmental sustainability index is 60-80 per cent and per capita income is Rs. 34029. This paper examines natural resources potentials and socio-economic status in the Indian Himalayan region. Qualitative approach was applied to conduct this study. Data were mainly gathered from the secondary sources and through participatory observation method. This study reveals that the potential of natural resources is quite high. It further depicts that the optimum/sustainable utilization of available natural resources may enhance the livelihoods and economic sustainability.

Key words: *Natural resources; water potential; biodiversity; agro-climate; socio-economy; Indian Himalayan region*

INTRODUCTION

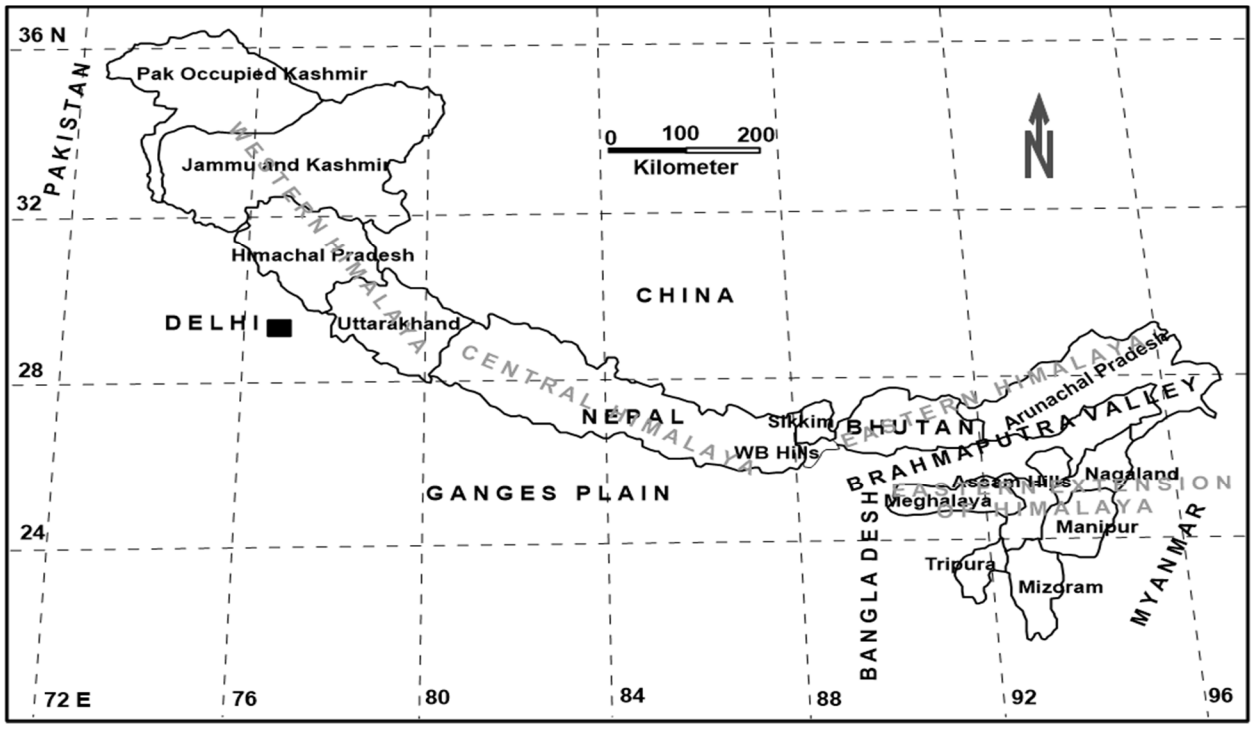
The Indian Himalayan Region (IHR) is endowed with abundance of natural resources in the forms of water, forest, fertile soil, pleasant climatic conditions and panoramic landscapes. Water potential such as glaciers, glacier-fed perennial rivers, the highland lakes, springs and ground water is abundant in the whole region. In terms of floral biodiversity, it is high in all altitudinal zones, comprises of sub-tropical to montane and temperate forests. The economic viability of these forests is significant. Alpine pasturelands/meadows are the repository of medicinal plants. The Himalayan region comprises of lofty snow clad mountain peaks, river valleys, alpine pastures and dense forest covers. Landscape is fragile and highly vulnerable to natural hazards. Agricultural practices are the main occupation and the major source of income. Meanwhile, the output from these traditionally grown cereal crops is less. Farming system varies from terraced cultivation in the western and central Himalaya to shifting cultivation in the eastern and eastern extension of the Himalaya. Environmental conditions are sound, as the environmental sustainability index (ESI) is 60-80 per cent. Literacy rate is also very high (78.73 per cent). The two peculiar situations are existed i.e. the rich land: presence of high economically viable natural resources; and the poor people: socially backward and economically underdeveloped. However, the whole Himalayan region consists of the high cultural, ethnic and biological diversity. In this region, about 171 schedule tribes are inhabited, which represents 29.8 per cent of the total tribal population of India (Samal *et al*., 2000). The landscape, climatic conditions, socio-economy and cultural status of this region varies from the western to central, eastern and eastern extension of the Himalaya. Meanwhile, the whole Himalayan region is underdeveloped. Furthermore, the infrastructural facilities are lagged behind. Human

Development Index (HDI) is low as a number of people are living below poverty line. This paper looks into the natural resources potentials and socio-economic status in the IHR. The study was conducted through the collection of data from the secondary sources; review of literature and through participatory observation method. Qualitative approach was applied for the further discussion on the natural resources potential, use pattern and socio-economic status of the inhabitants.

GEO-ENVIRONMENTAL SETTINGS

The Himalayan region is located in the south Asian countries, extended between 21° 57' – 37° 5' N and 72° 40' – 97° 25' E and stretches about 250-300 km (Figure 1). It is the world's highest, youngest and new folded mountain systems, is extending about 2400 km, from the 'Pamir's Knot' in the northwest to the Arakan-Yoma mountain ranges in the southeast as an arc. There are 30 mountain peaks in the Himalaya that rise to the heights of 7620 m. The Mount Everest, which is the world's highest mountain peak, has 8848 m height. Geologically, it is unstable and seismically and tectonically it is very active. It's extremely active geodynamic condition, even small tampering with the geo-ecological balance can initiate environmental changes that may eventually lead to alarming proportion (Valdiya, 1993, 2001; Gaur, 1998). The major countries that fall under the Himalaya are Pakistan, India, Nepal and Bhutan. Meanwhile, this study is confined to IHR, which covers ten states of the northern and northeastern India i.e. Jammu and Kashmir and Himachal Pradesh (Western Himalaya), Uttarakhand (Central Himalaya), Sikkim and Arunachal Pradesh (Eastern Himalaya) and Nagaland, Manipur, Mizoram, Meghalaya and Tripura (the eastern extension of the Himalaya). The hilly parts of Assam and West Bengal also form the Himalaya. The total area of this region is 533604 km^2, which represents 16.2 per cent of the total geographical area of India whereas it terms of population, it obtains only 3.86 per cent. The topography of the region is rough, rugged and undulating makes the Himalaya as one amongst the most fragile ecosystems of the world. Different geological orogeny has vast impact on diversity and distribution pattern of biotic elements (Singh, 2004).

Fig. 1: Location map of the Himalayan region



The IHR has high significance in terms of its geo-strategic location, as all the states fall under the geographical territory of the Himalaya, have strategic international boundaries and some of them are disputed. Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh share their international boundaries with China; Uttarakhand and Sikkim with Nepal; Manipur and Mizoram with Myanmar and Mizoram, Tripura and Meghalaya share their boundaries with Bangladesh. Jammu and Kashmir State has most strategic location as it shares its international boundary with Pakistan in the west, Afghanistan in the north and China in the east.

Climatic conditions vary according to changes in altitudes and seasons. The winter season is severely cold. Snowfall occurs in the middle and high altitudes. However, the summer season is moderate in the highlands and warm in the valleys. Heavily rainfall occurs during the four months of the monsoon season. The world's highest rainfall occurs in Cherrapunji, Meghalaya, and the eastern extension of the Himalaya. Here, rainfall is cyclonic in nature. In the western and central Himalayas, winter rainfall occurs due to the western disturbances that causes to heavy snowfall in the higher and middle reaches of the Himalaya. Floral biodiversity also varies according to altitude and rain. It varies from sub-tropical to temperate and alpine meadows/pastureland.

NATURAL RESOURCES POTENTIALS

Natural resources (renewable) and their potential in the forms of water, forests and land in IHR are abundant. Although, other mineral and energy resources are reported to have their presence in the Himalayan region yet, they are unexplored. Water is most abundant natural resource, available in the forms of glacier, glacier fed-perennial Rivers, the highland lakes, natural spring and ground water. At the meantime, it is unused and thus, the Himalayan region is known for its plenty and scarcity of water. It is one amongst the biodiversity hotspots of the world and known for its economically viable temperate coniferous forests. Landscape is very panoramic with having numerous topographies that attract the tourists from all over India and abroad. However, the landscape is also vulnerable to natural hazards. A number of natural resources and their potential are discussed in the following paragraphs:

WATER RESOURCE POTENTIALS

The Himalaya is known as the water tower of the world, as its glaciers account for about 70 per cent of the world glaciers, excluding the polar glaciers. The Himalaya occupies about 32 thousand km^2 area under permanent cover of ice and snow (Negi, 1991), which accounts for about 17 per cent of the total geographical area of the Himalaya. These glaciers are the major sources of perennial rivers that drain from the Himalayan states. The water availability and supply in the Himalayan states are largely met by the perennial rivers and they provide livelihoods to the people of this region. In addition, about 500 million people of the northern Indian plains are dependent on the rivers originating from the Himalayan glaciers for their water need.

There are three principal and 20 other river systems draining in the Himalayan region. The Sind (Indus) system is one of the three principal river systems, comprises of the Sind River and its five tributaries – the Sutlej, Jhelam, Chinab, Ravi and Vyas. These rivers originate from the Tibet highland and flow from Jammu & Kashmir and Himachal States of India and finally inlet into the Sind River which inlet into the Arabian Sea near Kranchi in Pakistan. The Ganges system comprises of its numerous tributaries such as the Bhagirathi, Alaknanda, Dauli, Vishnu Ganga, Nandakini, Mandakini, Pindar, Bhilangana, Ramganga, Koshi, Kali and Saryu with many other perennial sub-tributaries. The river Ganga is called Bhagirathi in the mountainous region of Uttarakhand. The third system is the Brahmaputra and its numerous tributaries that drain in the states of eastern and eastern extension of Himalaya such as Sikkim, Arunachal Pradesh, Meghalaya, Nagaland, Manipur, Assam and Mizoram. Beside these major river systems, the IHR has also other forms of freshwater reservoirs such as lakes, natural springs and glaciers and it yields about 500 cm^3 water/year. Monsoon rain, winter rain and heavy snowfall are the other major sources of water in this region

but, most of the monsoon rain is run-off. About 8634 million m^3 of water flows down from the Himalayan River every year (Negi, 2003).

Table 1: Principal glacial-fed river systems of the Himalaya

S. No.	River	Mountain area (Km^2)	Percentage of mountain area	Glacier area (km^2)	Percentage of glacier area
1.	Indus	268842	25.6	7890	33.1
2.	Brahmaputra	256928	24.5	108	0.5
3.	Subansiri	81130	7.7	725	3.0
4.	Kosi	61901	5.8	1281	5.4
5.	Karnali	53354	5.1	1543	6.5
6.	Sutlej	47915	4.6	1295	5.4
7.	Gandak	37814	3.6	1845	7.7
8.	Jhelum	33670	3.2	170	0.7
9.	Manas	31080	2.9	528	2.2
10.	Chenab	27195	2.6	2944	12.4
11.	Raikad	26418	2.5	195	0.8
12.	Ganga	23051	2.2	2312	9.7
13.	Lohit	20720	2.2	425	1.8
14.	Kali	16317	1.6	997	4.2
15.	Beas	12504	1.2	638	2.7
16.	Tista	12432	1.2	495	2.1
17.	Dibang	12950	1.2	90	0.4
18.	Yamuna	11655	1.1	125	0.5
19.	Ravi	8092	0.8	206	0.9
20.	Ramganga	6734	0.6	3	0.01
Total		**1050702**	**100**	**23815**	**100**

(Source: Hasnain, 1999; Nandi et al., 2006; modified)

Table 1 denotes principal glacial-fed river systems of the Himalaya. The Indus and Brahmaputra are the biggest river systems that represent 25.6 and 24.5 per cent of the total mountainous area, respectively. The river systems, which have above 4 per cent area, are Subansiri (7.7), Kosi (5.8), Karnali (5.1) and Sutlej (4.6). The other 14 river systems have drainage area vary from 3.6 per cent (highest) to 0.6 per cent (lowest). In terms of glacier area, the highest area is under Indus system, which occupies 7890 km^2 area and represents 33.1 per cent of the total glaciated area. This is seconded by Chenab system with 2944 km^2 areas (12.4 per cent) and Ganga system with 2312 km^2 area (9.7 per cent). Further, state-wise water resource in the IHR is depicted in table 2. Total length of rivers/canals is 49.53 thousand km, 2.42 lakh ha water bodies and 11311.22 total replenishable ground water (mcm/yr) and it vary from one state to other as shown in table 2.

Table 2: State-wise water resource in the Indian Himalayan Region

State	Length of rivers/canals (thousand km)	Area under water bodies (lakh hectare)	Total replenishable ground water (mcm/yr)
Jammu and Kashmir	27.78	0.30	4425.84
Himachal Pradesh	3.00	0.43	365.81
Uttarakhand*	2.69	0.20	-
Sikkim	0.90	0.03	-
Meghalaya	5.60	0.10	539.66
Tripura	1.20	0.17	663.41
Mizoram	1.40	0.02	-
Manipur	3.36	0.46	3154.00
Nagaland	1.60	0.67	724.00
Arunachal Pradesh	2.00	0.04	1438.50
Total	**49.53**	**2.42**	**11311.22**

(Source: Hand book on Fisheries Statistics 1996, Department of Agriculture and Cooperation and Ground Water Statistics 1996, Central Ground Water Board; Mcm: Million cubic Metres; Water bodies include reservoirs, lakes, ponds, tanks, wells and oxbow, etc.
* Annual Report 2003-04, Dept. of Animal Husbandry & Dairying)

LAND RESOURCES USE PATTERN

Total geographical area and per cent share of the Himalayan region depicts that Jammu and Kashmir State has the highest area and it shares 6.8 per cent of India's geographical area. Arunachal Pradesh seconded it (2.5 per cent). Himachal Pradesh stands third with 1.7 per cent. The lowest area is occupied by Sikkim (0.2 per cent). The other states are Tripura (0.3), Nagaland (0.5), Mizoram (0.6), Manipur and Meghalaya (0.7 each) and Uttarakhand (1.6 per cent). Agriculture and forest is the main land-use pattern and it is depicted in table 3. The IHR occupies 39.9 per cent forestland, varies from state to state while, India has only 20.64 per cent land under forest cover. Among the states of IHR, Mizoram state has the highest (87.42), which is followed by Nagaland (82.09 per cent). Arunachal Pradesh ranks third (81 per cent). The lowest area under forest is 9.57 per cent obtained by Jammu and Kashmir State. The other states have 25 per cent to 80 per cent forestland. In terms of state share of forestland in the IHR, Arunachal Pradesh stands first with 31.1 per cent followed by Uttarakhand (12 per cent), Jammu and Kashmir (10.3 per cent) and Mizoram (9 per cent). The lowest area under forest is shared by Sikkim (1.6 per cent) and Tripura (3.9 per cent). The second land-use is agriculture, which varies between 48.2 per cent (highest) in Meghalaya and 3.5 per cent (lowest) in Arunachal Pradesh. Nagaland obtains 38.4 per cent agricultural land ranks second. Tripura ranks third with 29.6 per cent agricultural land. Similarly, Mizoram state has 21.2 per cent, Sikkim has 16.1 per cent, Himachal Pradesh has 14.5, Uttarakhand has 12.5 per cent, Manipur occupies 7.3 per cent and Jammu and Kashmir has only 4.7 per cent agricultural land. In a nutshell, the IHR has 19.6 per cent agricultural land while, India has 55.8 per cent land under agricultural practices.

Table 3: Major land-use pattern

State	Geographical area (Km^2)	Per cent share of India's geographical area	Per cent share of IHR	Forest** area (Km^2)	Per cent share of state	% share of IHR	Per cent share of Agricultural land***
Jammu & Kashmir	222236*	6.8	43.1	21267	9.57	10.3	4.7
Himachal Pradesh	55673	1.7	10.8	14353	25.78	7.0	14.5
Uttarakhand	53483	1.6	10.4	24465	45.74	12.0	12.5
Sikkim	7096	0.2	1.4	3262	45.97	1.6	16.1
Meghalaya	22429	0.7	4.4	16839	75.08	8.2	48.2
Tripura	10486	0.3	2.1	8093	77.18	3.9	29.6
Mizoram	21081	0.6	4.1	18430	87.42	9.0	21.2
Manipur	22327	0.7	4.3	17219	77.12	8.3	7.3
Nagaland	16579	0.5	3.1	13609	82.09	6.6	38.4
Arunachal Pradesh	83743	2.5	16.3	68019	81.00	33.1	3.5
IHR	515133	15.7	100	205556	39.9	100	19.6
India	**3287263**	**100**	**-**	**678333**	**20.64**	**-**	**55.8**

(Source: *Included 78,114 and 37,555 km^2 occupied by Pakistan and China, respectively, and 5,180 km^2 handed over by Pakistan to China, **Satellite data, FSI, 2013; ***Wasteland Atlas of India 2000 & FSI 2000)

Note: Hilly parts of the two states – West Bengal hills and Assam hills constitute 3149 and 15322 km^2 area, respectively, excluded from this study.

FARMING A MAJOR SOURCE OF LIVELIHOOD

Agriculture is the major source of livelihood. It is characterized by traditionally grown cereal crops. Rearing livestock goes parallel and it supports agricultural practices. Similarly, forest contributes to agriculture and livestock activities and thus, agriculture, livestock and forests form an integral part in economic development. Economy of the region is highly dependent on the limited arable land and about 59 per cent workforce is involved in agricultural practices (Nandy and Samal, 2005).

Table 4 presents five agro-climatic zones in the IHR. Each zone has its own characteristics and subsequently, the farming system varies. The first zones comprises of the high altitude temperate climate (humid to arid), where annual rainfall is <1200 mm. Jammu and Kashmir state falls under this zone, is very famous for the cultivation of temperate fruits. The second zone characterizes hill temperate to cold and frigid climate (humid to sub-humid), varies according to altitudes. Annual rainfall is 1200 to 1800 mm. Himachal Pradesh and Uttarakhand states are located in this zone. The economy is largely dependent on subsistence terraced cereal farming and cultivation of developed temperate fruits. Sub-tropical to temperate climate, humid during about eight months of summer and semi-humid, during the four months of winter, characterizes zone third. Annual rainfall varies from 1800 to 2200 mm. The four states of Nagaland, Mizoram, Manipur and Tripura lie in this zone, is influenced by the subsistence shifting cultivation. Sub-Himalayan West Bengal, Sikkim, Assam hills and Meghalaya states fall under zone four, obtains 2200-2800 mm annual rainfall with developed tea and subsistence shifting cultivation. The climatic conditions vary from sub-tropical to temperate (cold and frigid in Sikkim), humid during about eight months of summer and semi-humid during the four months of winter. Zone fifth consists of temperate to cold and frigid climate, humid to semi-humid, obtains >2800 mm annual rainfall. Arunachal Pradesh lies in this zone where farming system is characterized by the cultivation of temperate fruits (moderate) and subsistence crops (terraced).

Table 4: Agro-climatic zones and their characteristics

Agro-climatic zone	Climate	Rainfall (in mm)	State/regions	Major farming systems
Zone I	High altitude temperate (humid to cold arid)	<1200	Jammu & Kashmir	Developed temperate fruits cultivation
Zone II	Hill temperate to cold and frigid (humid to sub-humid)	1200-1800	Himachal Pradesh and Uttarakhand	Developed temperate fruit cultivation and subsistence terraced cereal farming
Zone III	Sub-tropical to temperate climate humid during about eight months of the summer and semi humid during the four months of winter	1800-2200	Nagaland, Mizoram, Manipur and Tripura	Subsistence shifting cultivation
Zone IV	Sub-tropical to temperate climate (Cold and frigid in Sikkim) humid during about eight months of summer and semi humid during the four months of winter	2200-2800	Sub Himalayan West Bengal, Sikkim, Assam and Meghalaya	Developed tea cultivation and subsistence shifting cultivation
Zone V	Temperate to cold and frigid climate humid to semi humid	>2800	Arunachal Pradesh	Moderate temperate fruit cultivation and subsistence terraced cultivation

(Source: Agro-Climatic Regional Planning, Planning Commission, 1989; modified by the author)

POTENTIAL OF FLORAL BIODIVERSITY RESOURCES

The Himalaya is one amongst the biodiversity hotspots of the world (Sati, 2014). It comprises of over a thousand of species of trees, shrubs, herbs and climbers. Geo-environmental and agro-climatic conditions influence the nature and types of biodiversity. Forest types changes from western Himalaya to the eastern Himalaya. As Dhar *et al.,* (1997) observed that the western Himalayan forests are divers both in content and composition, whereas the eastern Himalayan forests are very rich both in flora and fauna. The main forest types have been recognized in the Himalaya by Champion and Seth (1968) and Negi (1990) are sub-tropical semi-desert, montane sub-tropical, montane wet temperate, Himalayan moist temperate, sub-alpine forests, moist alpine scrubs and dry alpine scrubs. The climate and biological communities vary considerably along the altitudinal gradients, provides a heterogeneous dispersion of biodiversity elements in the region (Singh, 2004). The richness of plant diversity is mainly due to the occurrence of species of other bio-geographic regions like Irano-Turanian, Mediterranean, Indo-Chinese, Indian, Malaysian, Eastern Asiatic, Circumboreal, Australian, Amazonian, Brazilian, Andean, North American and others (Chatterjee, 1939; Samant and Dhar, 1997). There are over 816 tree species, 675 edibles and nearly 1,743 species of medicinal value found in the IHR (Samant et al., 1998). The diversity of plant species used in various ailments is dispersed all across the IHR (Samal et al., 2002, Samal et al., 2004). Due to cultural and ethnic diversity in different bio-geographic provinces of the region, the knowledge base varies considerably (Maikhuri et al., 1998; Dhyani, 2000). The high exploitation of medicinal plant has adversely affected the very existence of a number of plants of high commercial value (Farooquee and Saxena, 1996). In the western, central and eastern Himalaya, the main forest types are pine, oak, fir, spruce and deodar, distributed according to altitudes, ranging from 1000 m upto 3000 m (Sati, 2006). In the eastern extension of Himalaya, forest types vary from tropical wet evergreen to montane and temperate forests, dominated by bamboo forests (Sati, et al., 2014).

SOCIO-ECONOMIC DEVELOPMENT

The whole IHR is socially backward and economically underdeveloped. Meanwhile, the level of development varies from one state to other. The states of the eastern extension of Himalaya, Eastern Himalaya and part of Himachal Pradesh and Uttarakhand are characterized by the dominance of indigenous tribal population and there are many tribal groups existed. The social status of these tribal people is deprived. The indicators of development such as HDI, people living below poverty line, literacy rate, per capita land, per capita income and ESI vary among the states; but overall, the economic status is underdeveloped. Table 5 shows the major indicators of development. The two states of the eastern Himalaya and five states of the eastern extension of Himalaya are shown combined. In terms of HDI, except Jammu and Kashmir and Uttarakhand states, where it is 0.529 and 0.490, respectively, the other states have higher HDI than to the Indian average (0.547). The highest HDI is registered in HP (0.652) while the average HDI of the states of the eastern and eastern extension of Himalaya is 0.573. Among the 28 states of India, Himachal Pradesh ranks third in HDI and states located in the eastern parts of the Himalaya rank sixth. Jammu and Kashmir state has 10th ranks followed by Uttarakhand (14th ranks). When we look into the persons living below poverty line, the IHR has less percentage (12.59) than to the national average (21.92). The highest poverty is noticed in Manipur (36.89 per cent) followed by Arunachal Pradesh i.e. 34.67 per cent. Sikkim has 8.19 per cent persons under poverty line. The other states have 20.40 per cent in Mizoram, 18.88 per cent in Nagaland, 14.05 per cent in Tripura and 11.87 per cent in Meghalaya.

The environmental quality in the Himalayan state is sound, as average ESI is 60-80 per cent. It is higher than the national average (40-60 per cent). Among the Himalayan state, Jammu and Kashmir has only 20-40 per cent ESI while, Himachal Pradesh and the states of eastern and eastern extension of Himalaya have average 80-100 ESI. Average per capita income is less (Rs. 34,029) in comparison to the national average (Rs. 38,169), except Himachal Pradesh, where it is Rs. 44,538.

The states located in the eastern part of Himalaya have only Rs. 29,480, Jammu and Kashmir has Rs. 25,425 and Uttarakhand has Rs. 36,675 per capita income.

Table 5: HDI, people living below poverty line, ESI and per capita income

States	HDI*	Rank*	Below poverty line** (per cent)	ESI*** (per cent)	Per capita income*** (in Rupees)
Himachal Pradesh	0.652	3	8.06	80-100	44,538
Jammu and Kashmir	0.529	10	10.35	20-40	25,425
Uttarakhand	0.490	14	11.26	60-80	36,675
Eastern Himalaya[1]	0.573	6	20.70	80-100	29,480
IHR	0.561	-	12.59	60-80	34,029
India[2]	**0.547**	**135**	**21.92**	**40-60**	**38,169**

*India's Human Development Report, 2013
** Reserve Bank of India, Annual Report 2012
*** ESI for Indian States, 2011, Centre for Development Finance, Chennai.
[1]Average of the seven states of the Eastern Himalaya and the eastern extension of Himalaya
[2]Average of 28 states of India

Table 6: Population profile, per capita land and per capita forestland, 2011

States	Population	Per cent share of India's Population	Population density	Literacy (%)	Per capita land (Km^2)	Per capita forest land (Km^2)
Jammu and Kashmir	12,541,302	1.04	56	67.16	0.018	0.002
Himachal Pradesh	6,864,602	0.57	123	82.80	0.008	0.002
Uttaranchal	10,086,292	0.83	189	78.82	0.005	0.002
Sikkim	610,577	0.05	86	81.42	0.011	0.005
Meghalaya	2,966,889	0.25	132	74.43	0.007	0.006
Tripura	3,673,917	0.3	350	87.22	0.002	0.002
Mizoram	1,097,206	0.09	52	91.33	0.019	0.017
Manipur	2,570,390	0.21	115	79.21	0.009	0.007
Nagaland	1,978,502	0.16	119	79.55	0.008	0.007
Arunachal Pradesh	1,383,727	0.11	17	65.38	0.06	0.049
IHR	43,773,404	3.61	85	78.73	0.01	0.005
India	**1,210,193,422**	**100**	**382**	**74.04**	**0.003**	**0.0006**

(Source: COI, 2011 and calculated by the author)

Table 6 depicts population profile, per capita land and per capita forestland. In terms of total population, Jammu and Kashmir State has the highest number of people and it shares 1.04 per cent of the India's population. Uttarakhand follows it with 0.83 per cent share. Sikkim obtains the lowest population with 0.05 per cent population share. Mizoram is the second lowest populated state (0.09 per cent share). The other states share between 0.11 and 0.57 per cent. The IHR as a whole shares 3.61 per cent India's population. Population density also varies from 17 person/km^2 in Arunachal Pradesh (lowest) to 350 in Tripura (highest). Uttarakhand state ranks second (189) followed by Meghalaya with 132 population density. In the IHR, average population density is 85. Data shows that population density is low and population distribution is sparse. Harsh geo-environmental conditions and high landscape vulnerability further accelerate this situation. Thus, migration from these states is high. An average literacy is 78.73 per cent, which is higher than the Indian average of 74.04 per cent. The two states of IHR – Jammu and Kashmir and Arunachal Pradesh have the lowest literacy rate i.e., 67.16 and 65.38 per cent, respectively. The highest literacy rate is obtained by

Mizoram, which is 91.33 per cent. When per capita land is compared, it is significantly high in IHR (0.01) km^2 while it is 0.003 km^2 in India. At state level, per capita land is highest in Arunachal Pradesh (0.06) followed by Mizoram (0.019) and then by Sikkim (0.011). It is obvious that those states which have low population density have high per capita land. Similarly, the per capita forestland is higher in these states, as Arunachal Pradesh has 0.049 km^2 and Mizoram has 0.017 km^2 forestland. The states like Uttarakhand and Tripura, where population density is high, per capita forestland is less, it is 0.002 km^2 in each state. In a nutshell, the IHR has 0.005 average per capita forestlands and it is higher than the national average.

DISCUSSION

The Himalaya Mountain possesses the plenty of natural resources in the forms of land, water and forest. Meanwhile, these natural resources are largely unused and thus, the people of this region are socially backward and economically underdeveloped. The Himalaya is characterized by inaccessibility, fragility, marginality, diversity, niche and adaptability (Jodha, 1992). Development concerns in the Himalaya also revolve around how resources of the region could be managed for conserving/improving the environmental values of the region together with socio-economic development of the people (Rao, 1997; Samal et al., 2003). There are several driving forces that affect the backwardness of the Himalayan region and they are mainly remoteness and inaccessibility, precipitous and undulating terrain, fragile landscape, harsh climatic conditions, geo-strategic location, political unrest, problems of terrorism and insurgency and lacking in infrastructural facilities. The whole Himalayan region is very remote and inaccessible and far from the main stream of development. Roadways are the main mode of transportation but most of the rural areas are inaccessible and the people have to walk miles for carrying their livelihoods. Terrain is precipitous and undulating and landscape is fragile therefore, road construction is a difficult task. Wherever, roads are constructed, the problem of landslides is common. This situation also appears worst for the economic activities. Industrial development is not possible partly due to fragility and precipitous nature of terrain and because of lack of infrastructural facilities. Agricultural practices are the main occupation and the major source of livelihood and it is carried out using various methods in the different geographical locations. In the western, central and eastern Himalaya, agriculture is practiced as terraced cultivation while, in the eastern extension of Himalaya, shifting cultivation is the main form of farming system (Sati and Rinawma, 2014). The output from traditionally grown crops is significantly low and thus, the poor rural people are struggling even for meeting the two times meal. The whole Himalayan region has geostrategic location. Jammu and Kashmir is facing the problems of terrorism from Pakistan. The states of eastern extension of the Himalaya are coping with the menace of insurgency, as many separatist groups are active and they create disturbances on the path of development. The group clashes in the tribal societies further accentuates the pace of backwardness. Harsh climatic conditions and lacking in infrastructural facilities are also very common. All these adverse forces have pushed this panoramic Himalayan region into socio-economic backwardness. The impact of climate change can be seen in all activities and in all walks of life. It has large impact on land use pattern such as water, forest and agricultural practices. The Himalayan glaciers are receding, as the Gangotri glacier is receding at an average rate of 23 m per year (Anonymous, 2005).

CONCLUSION

In this paper, natural resources potentials and socio-economic status of the IHR was examined. It was revealed from the study that the whole Himalayan region has abundance of natural resources in the forms of land, water and forest, panoramic landscape of touristic importance; it is a water tower and one amongst the biodiversity hotspots of the world. Per capita land, per capita forestland, ESI and literacy is comparatively high in the Himalayan region than to the national

average. In spite of abundance of natural resources and its high potential for the socio-economic development, the whole Himalayan region is socially backward and economically underdeveloped. The number of people living below poverty line is higher and a large number of people are suffering from malnutrition and food scarcity. Per capita income of the people is also low. Further, due to malnutrition and food scarcity, infant mortality rate is high. Optimum/sustainable utilization of natural resources can enhance the economic development of the region. This can be achieved through sectoral development and through identifying the areas of potentials and fixation of priorities. Connecting remote rural areas by ropeways and road transportation, keeping landscape fragility/suitability in mind, can bring them in the main stream of development. Development intervention through community participation in the decision making, modern innovation in the farming systems, cultivating cash generating crops according to the agro-climatic conditions, establishment of small-scale village level industries, optimum use of timber and non-timber forest products, development of eco-tourism and installation of hydropower projects for generating electricity will augment employment, generate income, enhance livelihood options and will check outmigration.

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