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The Analysis Of Perceptive Behavior Of People On The Environmental Status, Impacts, And Problems Related To The Urban Area Of Rishikesh Town, Uttarakhand, Western Himalayas, India

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Abstract

The environmental status and impacts were studied in the urban area of Rishikesh. The primary and secondary data were used to analyse the environmental impacts and status. Under the primary data; field observation and people perception were taken. The stratified random sampling method was adopted to know the urban problem, Resiklesh action plan, and impacts of urbanization. This region had a huge influx of tourists during the time of peak season (April to July). During the tourist season the problem of solid waste had increased. The roads, drainage system, and solid waste management system were not improved as per the action plan of Rishikesh city. Resikesh was also facing the same problem as the other small Indian cities, the problem of stray, cows, and dogs was very common. .The region had good facilities of schools, colleges, universities, medical colleges, management colleges, adventure sports, tour and travel, and meditation yoga. People of the region were not satisfied with the quality of these social infrastructures. Region had availability of electricity, drinking water, internet facilities but their quality and improvement were not accepted as world level. It was evident from the field survey and discussion with the local people that the region has good connectivity of roads and streets road to every residential and commercial area. Every landscape has a limitation of its ecosystem service when we create pressure on the available natural resources then the self-mechanism of nature does not work and natural eco service is interrupted and the ecosystem in a sluggish way goes toward death. The drainage, forest, and land resources of the national capital were severely damaged and now it is very difficult to revive and rejuvenate these resources.

Key words: Western Himalayas, Rishikesh town, Tourism, Environmental Status and Impacts

1. Introduction:

In recent times the problem of environmental degradation due to mismanagement is increasing which affects the biodiversity and socio-economic life of people (Arohunsoro et al., 2014). The conditions are more adverse in the Himalayas region the many tourist towns and cities (Dehradun, Nainital, Shimla, Kullu, Dharamshala, Mossure, Manipal Gagtog,) were facing the same problem of degradation of the natural landscape. There is a need to rethink, rearrange, and manage the tourist spots of the Himalayas region (Naresh et al., 2018). Land use land cover is the main factor that has determined the healthy ecosystem and healthy eco service of the region. Today many natural landscapes had been changed into the cultural landscape. Every landscape is always natural but when these are used by humans for their benefit then it became the cultural landscape (Cohen, 1995). The land use land cover status of any region represents its sustainability in the future (Rautela et al., 2014). The recent time Indian Himalayas regions (IHR) was facing the threat of hazards and have a huge potential risk of disaster in the overcrowded tourist hot spots (Nanital, Dehradun, Rishikesh, Shimla, Kullu, and Dharamshala). The haphazard growth of the cities increased the vulnerability of hazards impacts (Banba, 2017). Rishikesh is a main hot spot of Utrrakahnd tourism and one of the best attractive places and meditation points of view. The tourism sector is the major contributor to the Himalayas economy and also shared the 40% contribution (Kumar, 2015). To organize the society there is a need for cooperation, working of local peoples, NGOs, farmers, businessmen, administrators, politicians, researchers, environmentalists, sociologists, and planners to achieve the sustainable goal of urban development (Morton et al., 2017).

2. Study area

Rishikesh is geographically located 30.103368°North 78.294754°East in the Dehradun district of Uttarakhand. It is located 21 km (13 mi) north of the city of Haridwar and 45 km (28 mi) southeast of the state capital Dehradun. This holy city is located in the foothill of the Himalayas and its average altitude is 330m from the sea level. The city is governed by the municipal corporation since 2017 and in current times this city is known as the "Gateway to the Garhwal Himalayas" and "Yoga Capital of the World". The city is known for its ancient meditation practice and is visited by many Hindu sages, and saints Rishikesh has an approximate population of between 252,533 and 320,222, making it the seventh most populated city in the state of Uttarakhand (Fig.1).

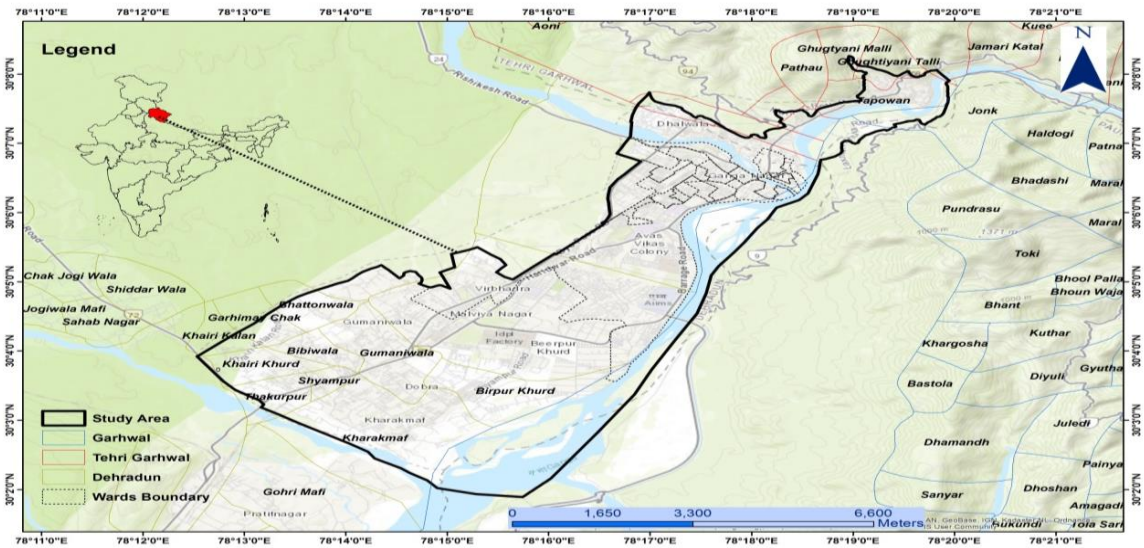

Fig. 1 Study area

3. Method and data

The environmental status and impacts were studied in the urban area of Rishikesh. The primary and secondary data were used to analyze the environmental impacts and status. Under the primary data; field observation and people perception were taken. The stratified random sampling method was adopted to know the urban problem, Resiklesh action plan, and impacts of urbanization. Under the stratified random sampling, the field survey was conducted in the area of Tapovan, Swargashram, MunnikiRati, Maya Kund, Dhalwala, Manvendra Nagar, MayurKund, Ganga Nagar, Awas Vikas Colony, Bapu Gram, IDPL Colony, Pashulok, Khadri and Shyampur (Fig 2). The random sample collections were done within the buffer of 1000m. Then the data was analyzed and represented through the tables, graphs, diagrams, and maps (Bartelett et al., 2001). A total of 112 survey samples (n=112) were collected. The most of interviewees were local people and belong to different shopkeepers, teachers, professors, students, researchers, NGOs, farmers, and tourists. Most of the people (90%) were belong to the local area, and 8% of interviewers were from the outer states of India. Only 2% of respondents were a foreigner.

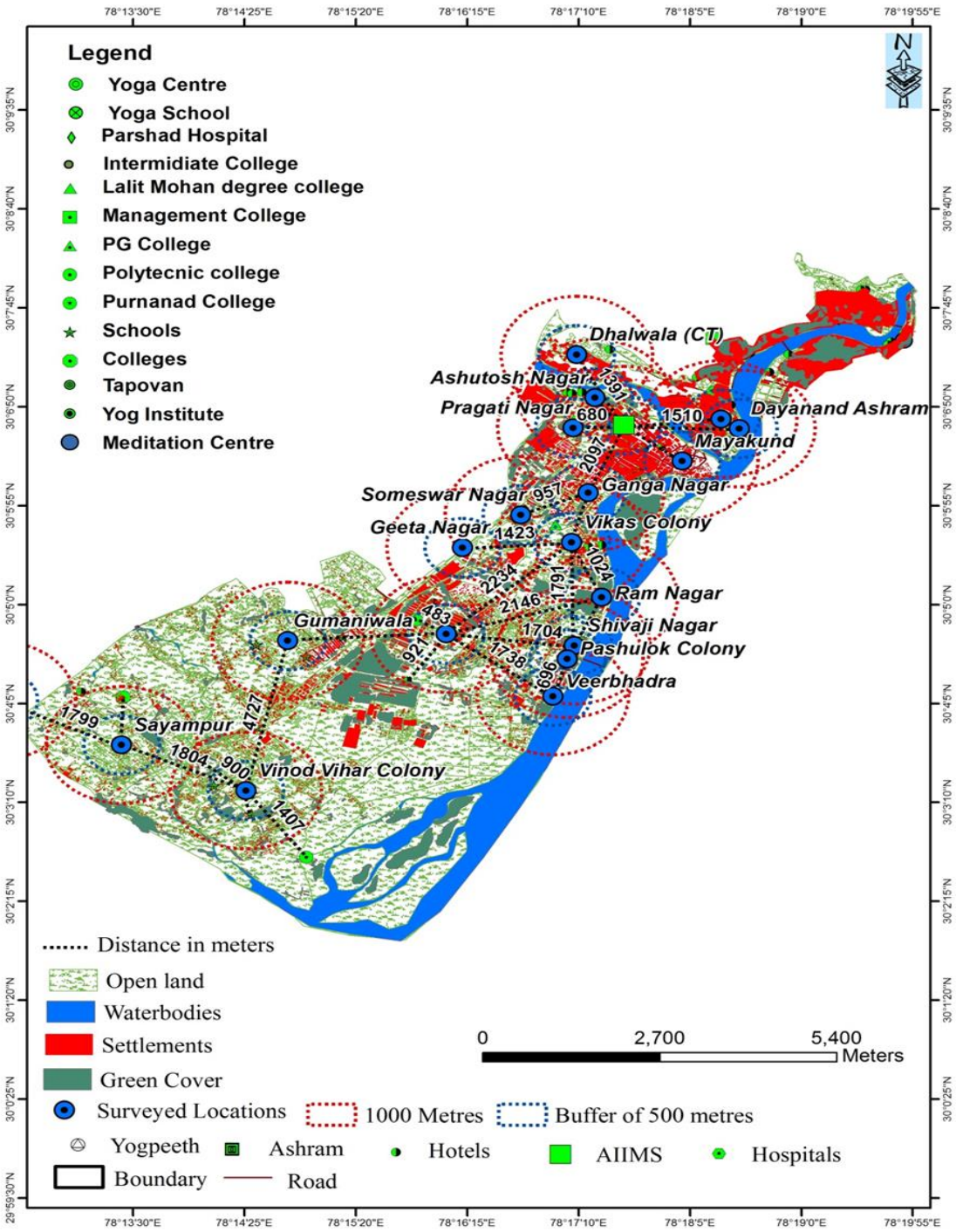

Fig. 2 Survey location and sampling in study region

4. The result and discussion

4.1 Attraction and likeness of place

The respondent's perceptions were taken about the attraction and likeness of place. 72% (81) of respondents believed that the place was still attractive and valuable from a tourism point of view. 23% of respondents believed that the place is very good from an attractive shrine point of view. Only 7% of people believed that because of mismanagement, excessive growth of settlements, and pollution the place is degrading day by day. 7% of respondents believed that the place was not good from a tourism point of view (Fig.3).

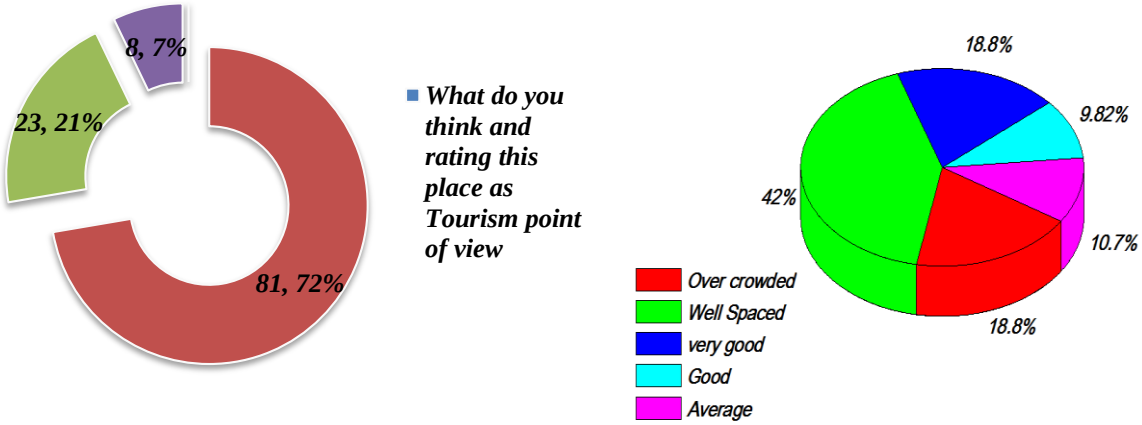

Fig.3 People perception on likeness of place and on feeling of healthy environment

4.2 Perception on feeling of Healthy environment

The respondent's perceptions were taken on their feeling about a healthy environment. 42% of respondents believed that the town was well spaced with greenery. They also believed that the place was suitable for meditation and yoga. The local people (18.8%) of the area believed that excessive developments of settlements were noticed in the area of Munni ki Rati, Dhalwala, Ganga Nagar, and Bapugram. Residents of the area also observed that the excessive growths of the settlement were noticed after 1990. 18.8% of respondents also believed that the region is very attractive and valuable from an ecotourism point of view. 9.82 % of respondents were clear that the place is good and better in comparison to the other crowded cities in the region. 12 (10.7%) respondents believed that nothing advanced and modern development activities were done in comparison to the developed nation (Fig.3). The problem of solid waste, drinking water, and slums were remaining.

4.3 Environmental Problems

Respondent's observations and views were taken through the process of interviews. The solid waste problem was noticed by 51(46%) respondents in the city. They believed that the people generate waste materials like disposal, plates, cups, old clothes, medical disposal; hotels restaurant waste also emanates a foul smell and also poses a threat to people's health (Yadav, 2014). Such types of problems were noticed in and surrounding areas of water bodies and river tributaries. The problem of water pollution was also observed by 33 (29%) respondents (Fig.4). They believed that these problems existed because of human-generated waste and poor drainage systems. The interviewers 16 (14%) of Pasulok, Khadri, Shaympur, and Verbhadara noticed the problem of soil degradation caused by poor management of the drainage system. However, the problem of air pollution was least highlighted by respondents 12(11%).

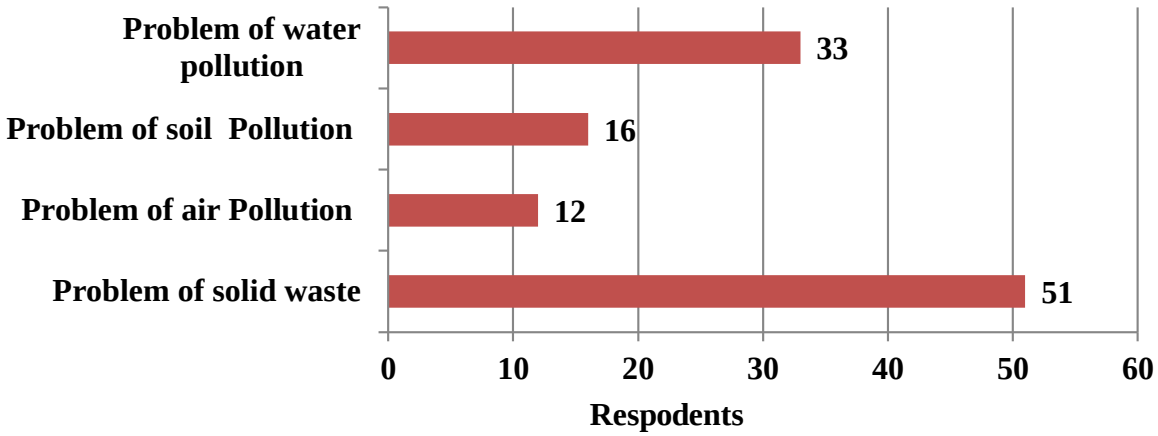

Fig.4 People's perception on the environmental problems

4.4 Social Infrastructure related issues

The people's perceptions were taken on the social infrastructure facilities of the study area. The facilities parameters were classified into four subclasses such as very good, good, average and not good (Yadav et al., 2015). Then their responses were taken on every subclass of parameters. 19% of respondents believed that the region had very good transportation facilities, 28% of respondents agreed that the region had very good road availability, 35% of respondents were believed that the region had better internet facilities, only 18 % were responded to the region had very good electricity facilities. 44 (29%) respondents verified that the region had good road facilities. The electricity's good facilities were liked by 23 %(35) interviewers. 23% of respondents believed that the region had good internet connectivity. 39 (26%) respondents of the region believed that the region had good transportation facilities (Fig.5 & Table 1).

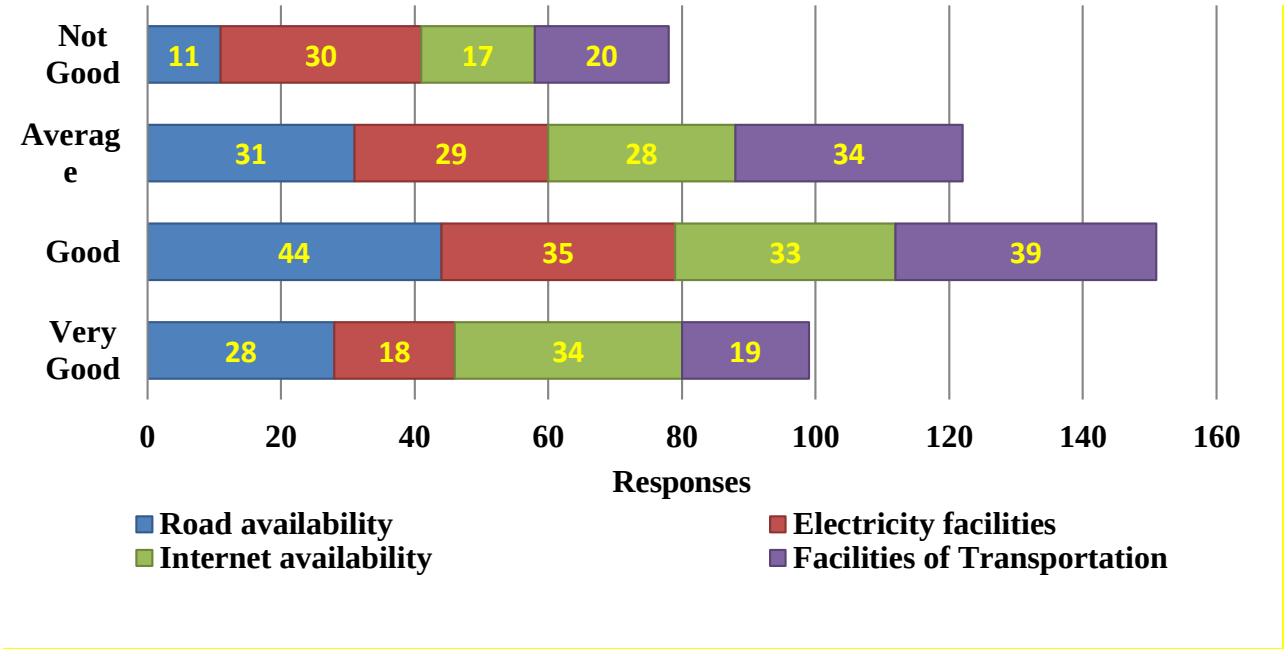

Fig. 5 Responses on social infrastructure (n=112)

Table 1 People responses on social infrastructure facilities

Social Infrastructure related issues	Very Good	Good	Average	Not Good
Road availability	28	44	31	11
Electricity facilities	18	35	29	30
Internet availability	34	33	28	17
Facilities of Transportation	19	39	34	20
Average	**24.75**	**37.75**	**30.5**	**19.5**

Source: Field Survey

31(25%) respondents believed that road facilities were average. They believed that there is a need for improvement. The road quality should be like as international tourist places. 29 (24%) believed that all houses are electrified and the supply was satisfactory (Table 2). They were 28(23%) who accepted that internet facilities were average in the whole Rishikesh area. They34 (28%) also admitted that the transportation facilities are not good but on an average. Some respondents believed that the roads systems were not developed as per the Resikesh master plan. However, the all small markets residential areas were well connected by road. But roads and streets were not developed like the developed nation. However, people believed that there was no lack of funds for infrastructure development but it was the problem of the political system and administrative system (Fig.5 & Table 1). 14 % of respondents were not satisfied with the road condition. 30 (38%) interviewers believed that the electricity supply was not sufficient. 22 % (17) respondents wanted more improvement in the internet facilities. 34 (28%) respondents believed that the respondent's facilities were not as per the famous tourist place of India (Table 1).

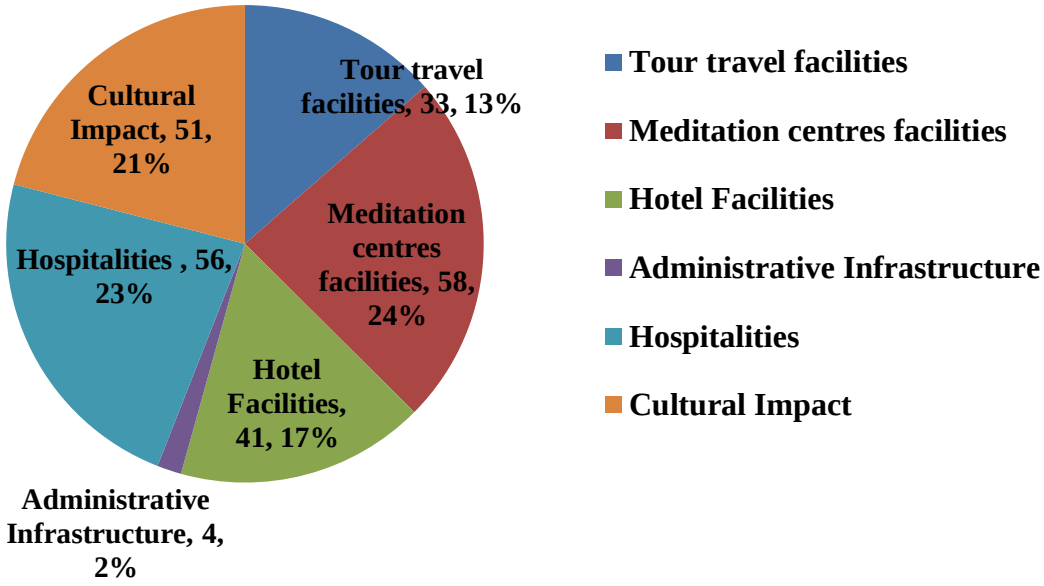

Fig.6 People perception on the different facilities and issues

The people's perceptions were taken on the available facilities in the study area. The 13% (33) respondents in the study area believed that travel and tour facilities were excellent in the study region. 21% (51) people believed that the study region had adverse cultural impacts. Some people also believed that because of global interaction the publicity and business of this area had been developed. 17% of respondents of the study area also accepted that the region has excellent facilities of hotels and restaurants. 56 (23%) local people believed that the region has excellent facilities from a hospitality point of view (Fig.6). However, 2% of respondents believed that administrative infrastructure was effective from a planning and management point of view.

Table 2 Satisfactory responses on the different facilities

S.No.	Facilities	Satisfactory Responses	Responses (%)
1	Tour travel facilities	19	16
2	Meditation centers facilities	11	10
3	Hotel Facilities	22	19
4	Administrative Infrastructure	34	29
5	Hospitalities	20	17
6	Cultural Impact	10	9

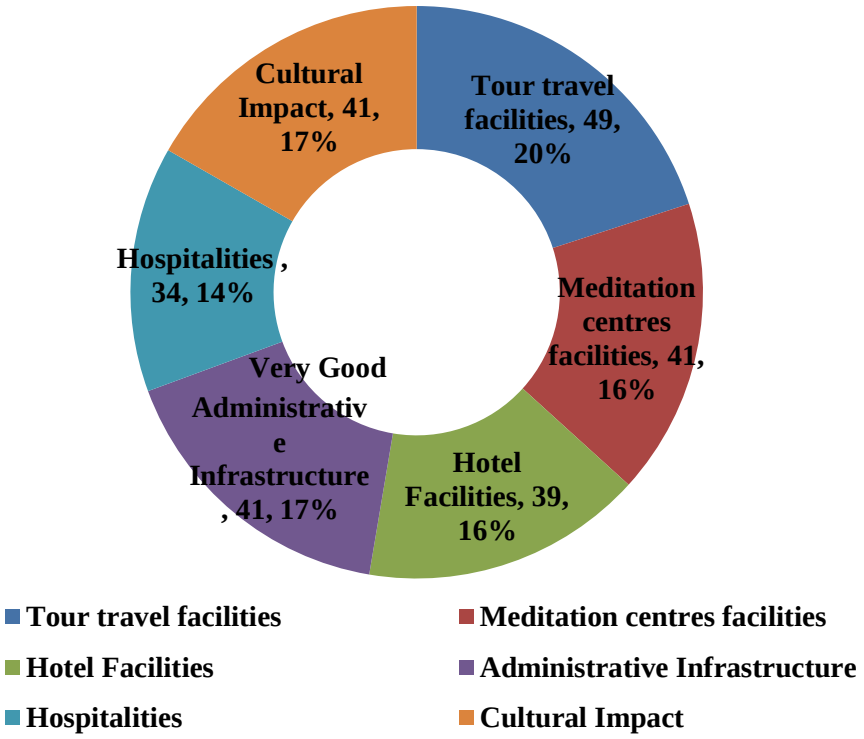

Fig.7 People responses on different facilities

17% of respondents believed that region has a positive impact on cultural activities. Today region is known as the Yoga capital of India and is also recognized on an international level. Tour and travel facilities were very good in the study region accepted by 20% (49). 16% of respondents believed that the region had very good meditation centers which were visited by many tourists from India and abroad. It was evident from the responses that the region has a very good availability of hotels, restaurants, and guest houses. The hospitalities of the region were very good in comparison to the other part of the region which was supported by 34% of respondents. 17% of respondents of the region believed that the region had good administrative infrastructure (Police, education, health, agriculture, and Public work department (PWD) and which was very helpful for the development of the region (Fig.7 & Table 2). Satisfactory responses were received on the different facilities of the region. Interviewer's people believed that the region has satisfactory facilities related to tour travel facilities (16%), meditation centers (10%), hotels and restaurants (19%), administrative infrastructure (29%), hospitalities (17%), and cultural impacts (9%). Respondents believed that the region had all facilities but there is a need for more work to develop them at the world level. Interviewers also believed that Resikesh action plan does not reach its ground reality.

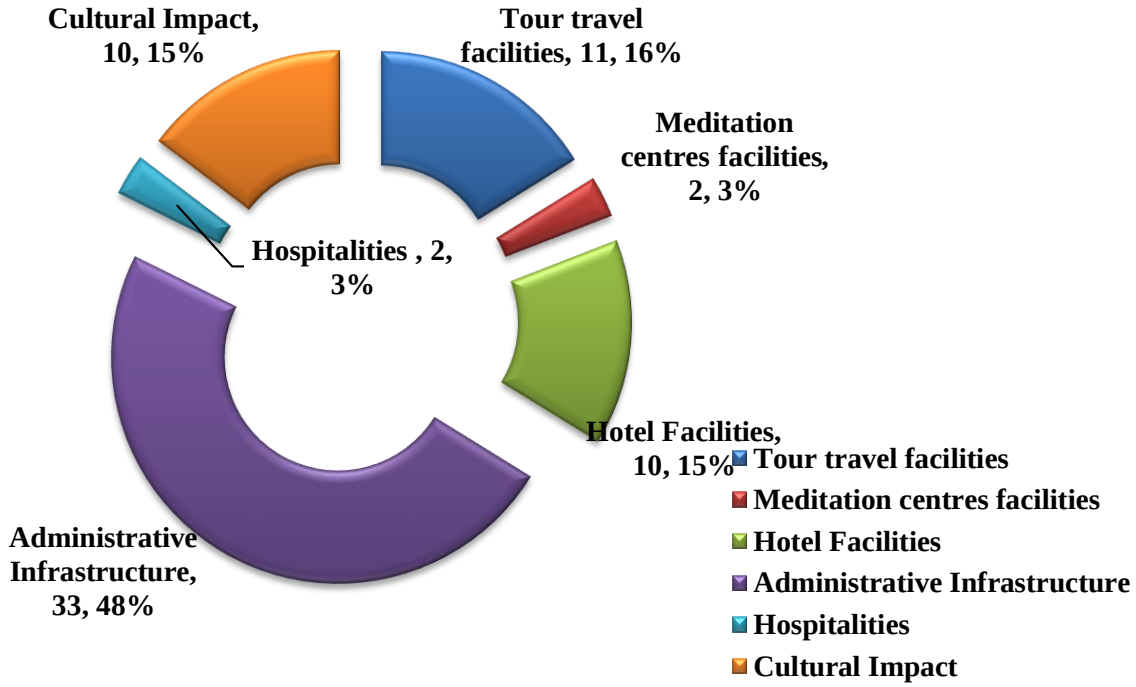

Fig.8 The unsatisfactory (not good) responses on different facilities in region

Some respondents were unsatisfied on the different facilities and issues of study region. They believed that region had many problems and not improving as per the action plan. The unsystematic settlements growths were very common (Fig.8). 48% respondents were believed that region had unsatisfactory administrative infrastructure, 16% believed that region had not good tour and travel facilities, 15% respondents were not satisfied with hotel facilities. Only 2-3% respondents were not agrees with the hospitalities and facilities of meditation centers. 15% respondents were believed that excessive growth of tourism business had adverse impacts. Some were believed that the problems of drugs and alcohol were common (Chaudary *et. al.*, 2020).

5. Analysis of hazards perception

People's responses were taken on the likelihood of the hazard. It was clear from the survey result that most respondents were aware of the hazards but they were not satisfied with the preparedness and management. 110 respondents of the study region believed that there would be a danger of flood in the future. Their responses were evident that the condition along the river bank was not a good many settlements had been constructed. It could be harmful to humans in the future. One respondent believed that the Himalayas region is known for the geohazards like landslides, floods, and cloudbursts and Uttrakhand is the hotspot of these floods, landslides, earthquakes, and cloudbursts. 100 respondents believed that the region has a gentle to moderate slope so there would be no chances of landslides incidences (Fig.9).

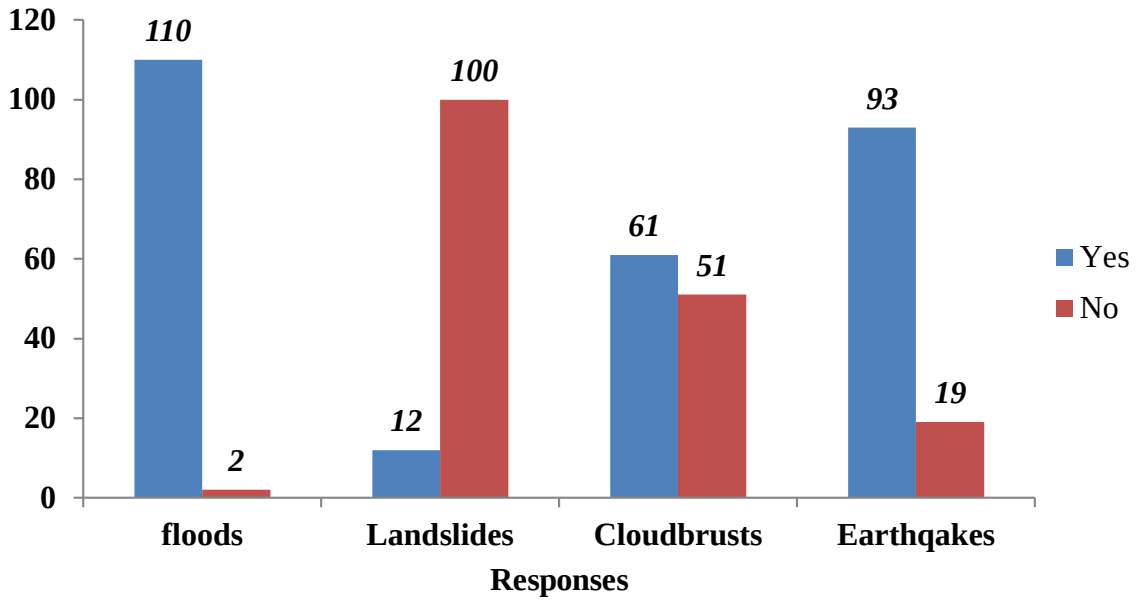

Fig.9 People responses on the geo-hazards

However, 61 respondents believed that there are chances of cloudbursts, and incidences of cloudbursts can bring excessive mass movement with debris. 51 respondents were not believed that there would be a danger of cloudburst but they accepted that there would be the vulnerability of flood (Fig.9). The incidences of earthquakes were very common in the Himalayas region, the Himalayas is a young folded mountain, and yet current in its uplifting faze the plate tectonic activities are still in action. Some respondents also believed that the earthquakes in this region are common but it would be more serious and risky when it will cross the scale of high vulnerability. 93 respondents strongly agreed that we can't deny the risk of earthquakes (Fig.9). The geographic information system analysis was done to know the general vulnerability of the region; it was evident from the GIS analysis that a 22 km2 area of the region fell within the 100 river buffer (DMMC, 2010; DMMC, 2012). The buffer area is considered the flood plain, and this area contains many settlements, valuable land, and other human properties (Fig.9 & Fig.10).

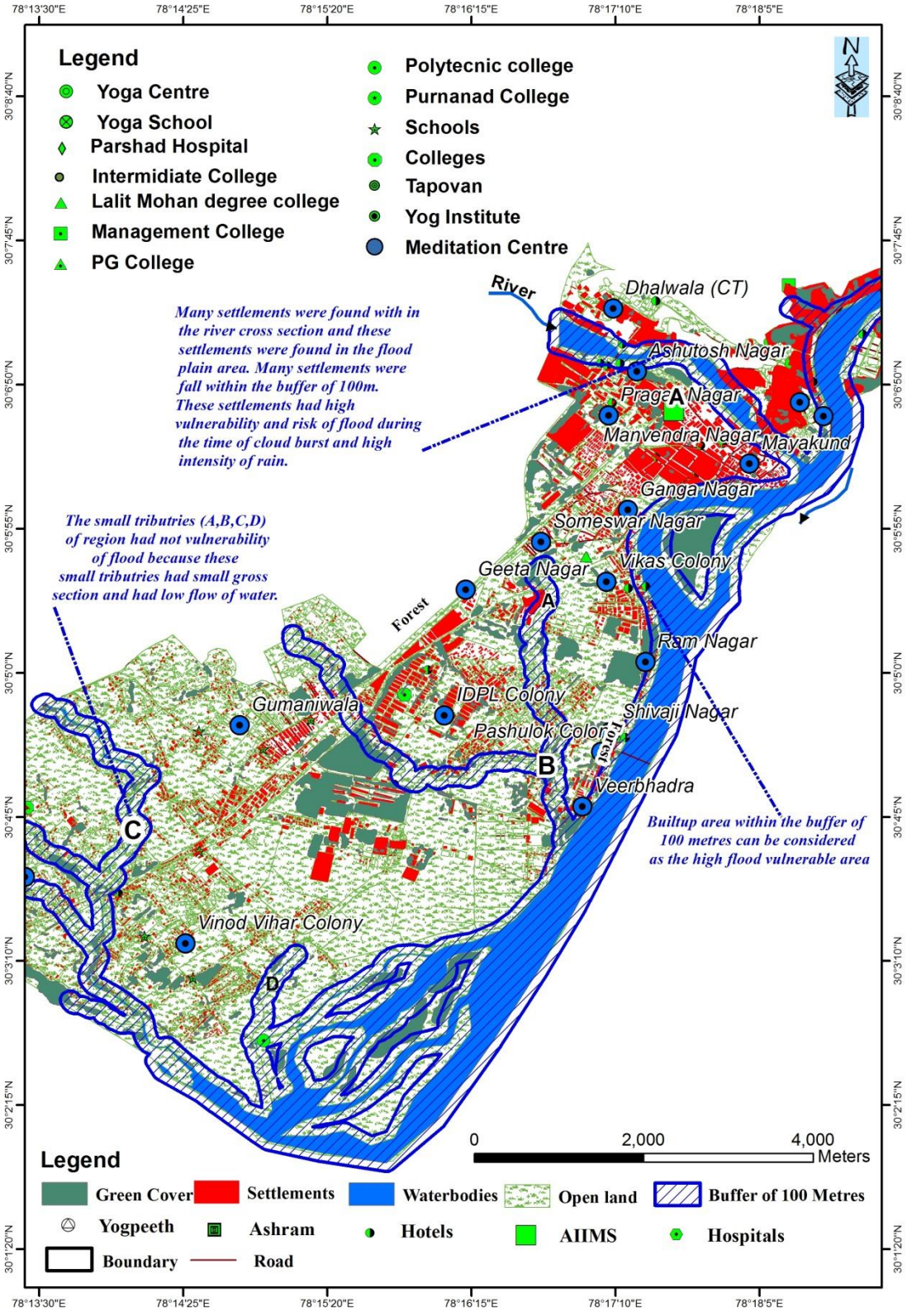

Fig.10 Proximity analysis of flood vulnerability in Study region

6. Impacts of land use planning in study region

In an area like Munni Ki Ratti, Dhuliwala, IDPL Colony, Veerbhadra region, BSNL colony area had received excessive growth of settlements this lead the situation of a congested environment which letter will generate many environmental problems. This is very common if the population of the region will increase there will be more pressure on the utilization of land resources. The settlement's growths were also observed in the flood plain of the river. This activity also leads to many other socio-economic and cultural problems in the region. The meditation centers, hotels, restaurants, and guest houses were also

noticed to mushroom in growth. The agricultural land of the southern region like Khedra, Pnera like the area was transformed into a built-up area. The pressure of urban agglomeration will be more in the commuter zone and near the rural area. The green cover of the whole region was also increased but if we had observed in a particular area such as Ganga Nagar, Manvendra Nagar, Dhalwala, the green cover slightly decreased, in these areas the drainage system was also affected due to the growth of the settlement. The natural drainage system (Small Nallas) was adversely affected due to anthropogenic activities. In the future, if the drainage system will not improve then there will be many adverse effects in future. The land use land cover of the region simply represents that a small city is expanding from north to south because the city had natural boundaries of the river in its northeast, south direction and forest in its west direction. The available land resources existed in the south-central part of the region (Fig.11).

7. People suggestion for the mitigation of environment adverse impacts

1.1 Respondents of the study region replied that this region had a huge influx of tourists during the time of peak season (April to July). The Rishikesh was visited by thousands of tourists every day. During this time problem of solid waste had increased and there was a need for more public toilets. There should be the management of bio-toilets to reduce the permanent problem of solid waste (Rawat and Daverey, 2018). There should be a solid waste management plant in this region. However, Japanese companies were for Resikesh beautification and sanitation of River Banks. There is a need for the improvement of Ghats (Ganga Ghat) in a modern and sustainable way as tourism point of view.

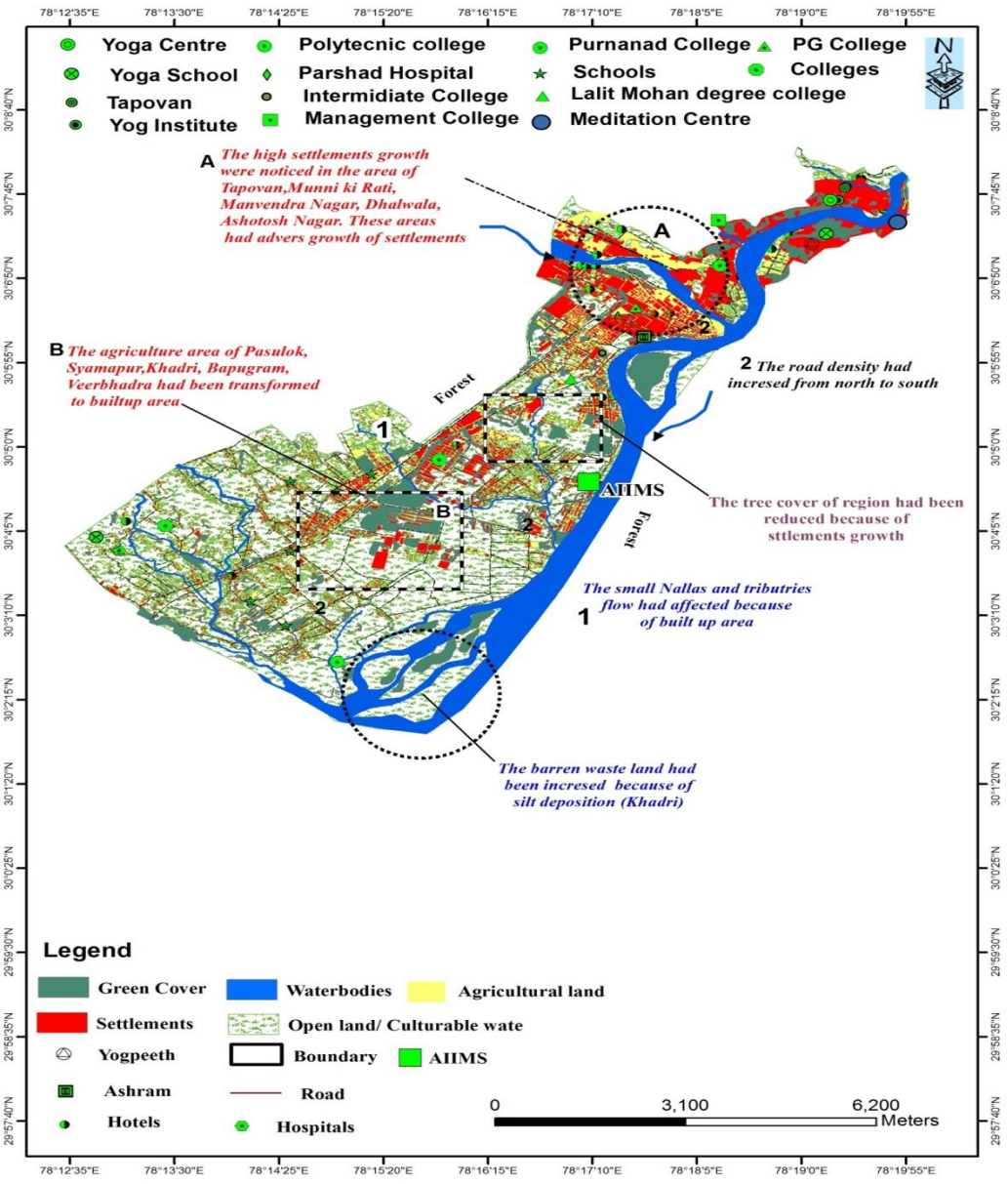

Fig.11 Land use impacts representation through descripted map

1.1 Many respondents believed that the roads, drainage system, and solid waste management system were not improved as per the action plan of Rishikesh city. The parking facilities should be improved because during the peak season it becomes a huge problem. They wanted improvement in roads, drainage, and sewage system because they believed that because of population growth the traffic congestion had increased (Mishra and Tripathi, 2008) (Fig.12A).
1.2 They also suggested that there were many meditation centers, Yoga centers are growing day by day they want proper registration of these centers under the edge of the Ayush department of India. Because, these centers had positive and adverse cultural, and socio-economic impacts. Their monitoring is very important from a cultural and social point of view because everyone knows that Rishikesh is a holy city is always been known for its religious tourism since ancient times (Fig.12B).

1.3 They suggested that the river starch from Ram Jhula to Laxman Jhula is very attractive from a water sports point of view. It should be improved and developed in an advanced way from a river rafting point of view (Fig.12C)

1.4 Resikesh was also facing the same problem as the other small Indian cities, the problem of stray, cows, and dogs was very common. There should be cow shelters (Seva Sadan) however there were many cow shelters but their functioning was not proper. They should be checked properly and should take under the municipal corporation. The Triveni Ghat and Ganga Ghat were facing the problems of water pollution, their problems should be dissolved within time. They also suggested that some rural areas had no public transportation facilities (Haritash et al., 2014).

1.5 The public transportation should be improved within the buffer of 10 km. They also suggested that the surrounding rural area has not to better place for children to play they suggested that there should be an improvement and new construction of playgrounds under the Khalo India Fit India movement. Under the social well-being, there would be improvements and create new recreation resources in this region.

1.6 Some interviewers believed that the region's central place had better facilities of electricity, drinking water, medical, roads, and Internet but it would be more improved in and around its surrounding rural area (Fig.12D).

1.7 One respondent from Birthapur replied that this area faces the problem of water, road, transportation, and irrigation facilities. People of the region believed that in this region Japanese company was working on many projects under the Rishikesh action plan. But local people's livelihoods were not sustained by these outsourcing companies. However, they suggested that the employment opportunity for local people should be reserved under such types of companies and projects.

1.8 The socio-economic condition of the Dandi village had been improved within 20 years. Before 2000 the condition was not good. They replied that the Dandi village economy was dependent on agriculture. Very few people have engaged in the tourism business but these days because of COVID the tourism business-based livelihood had been finished. They also believed that the horticulture and agriculture department intervention was very limited. However, these villages can be developed as agricultural products services providers to tourist hot spots. The village was just 13 km away from the main tourist hot spot and the village has huge potential from an agriculture& horticulture point of view.

1.9 A group of respondents replied that in the southern region of Rishikesh the 10% agriculture area had been converted for the built-up purpose. They also believed that the forest land, riverbank, and CPR (Common Properties Resources) land were illegally occupied by many businessmen. They suggested that there would be assets mapping of all land and cultural resources under the Resikesh action plan. The geographic information system (GIS) and remote sensing (RS) drone-based mapping can solve these problems.
1.10 The local people of the region replied that we encourage outsourced business entrepreneurship, and tourists but can't allow anyone to degrade our holy, natural cultural landscape (Fig.12 E & F).

Fig.12 A &B Interaction with the local resident of Manvendra Nagar C. Interview of shopkeeper in Dhalwala D. Education infrastructure Seema dental college , Resikesh E. Discussion with the owner of tour and travel in Resikesh town F.Interaction with the police officer, Tapovan

Conclusion

The people were interviewed about the overall facilities of the region. They were asked about the social infrastructure availability, quality, and accessibility to local people. People believed that was not any doubt that the region had noticeable improvement after 1990. But they don't agree that the region is developing sustainably. They agreed that the region had good facilities of schools, colleges, universities, medical colleges, management colleges, adventure sports, tour and travel, and meditation yoga. But they were not fully satisfied with the quality of these social infrastructures. They were also accepted that there was not any doubt that region had availability of electricity, drinking water, internet facilities but their quality and improvement were not accepted as world level. It was evident from the field survey and discussion with the local people that the region has good connectivity of roads and streets road to every residential and commercial area. But there is a need for road quality improvements at every level. People were asked on ranking forms number 1 to 5 the survey result revealed that only 7% of respondents were believed that place deserve first place,13 % were satisfied with the rank of 2, 20% with the rank of 3, 27% were with the rank of 4, 33% were ranked

place as 5. The built area of the region was continuously increasing, many settlements and roads were constructed and also representing the unsystematic growth of the settlement. There is a need to check the development of tourism infrastructure for sustainable management. This region was also considered the commuter zone and rural area. There is a need for more concern and management for its developments.

This region has huge potential for land resource utilization but it should be sustainable. Every landscape has a limitation of its ecosystem service when we create pressure on the available natural resources then the self-mechanism of nature does not work and natural eco service is interrupted and the ecosystem in a sluggish way goes toward death. The drainage, forest, and land resources of the national capital were severely damaged and now it is very difficult to revive and rejuvenate these resources.

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