

Socio - environ impact of river rafting industry on Ganges in Uttarakhand, IndiaParth Sarathi Mahapatra¹, H.B.Vasistha¹, Rajiv Pandey²

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ABSTRACT

This paper addresses the social and environmental impact of river rafting industry with special focus on river Ganges. It revolves around, identification and characterisation of the possible impacts on a larger perspective which will provide a better opportunity for the perspective inclusion of the industry in context of the country's sustainable growth and development. Accordingly by these projections a directional approach can be devised for reducing the adverse impacts and synchronize the project to provide opportunity for the rural destitute. The spatial focus for the study was Kaudiyala – Tapovan Ecotourism Zone on passage to Himalayas along river Ganges, Uttarakhand, India. The focussed information was collected through questionnaire for primary data, from randomly selected individual i.e. local people, primary (camp management) and secondary professionals (local shop owners, employees, etc.) of the industry; likewise some other relevant data were assessed by collecting disclosure of population in groups. Overall, the pertinent discussions encompassed twenty rafting camps, during 2008–2010 and the secondary data from some state agencies. The total camps in the region was around 74 in 2008-09 with camp area of 0.18 million m², which has increased 90 times in last one and half decades. The number of tourists enjoying rafting varies with seasons and comprises 32% foreigners and 68% national. The result indicates that due to improper management and lack of directional approach from state agencies, the potential contribution of the industry remained quiet minimal for socio-economic development in the remote region. The impact on the local identity and traditional culture though moderate were also apparent and reported by locals. Environmentally, it lacks the monitoring of solid waste management generated from kitchen to defecation within submergence zone. These impacts are discussed in a matrix form with their explanations and elaborations based on field observations.

Key words: EIA, SIA, River Recreation, Tourism on Ganges, River sport in India**1. Introduction**

The concept of environmental protection and resource management has traditionally been given due emphasis and woven in all facets of life. These practices provide opportunities for people to live in perfect harmony with nature on sustained basis. However, these facades are being jeopardised under the present context of development. Nevertheless, changing life styles, increasing pace of urbanization, industrialization and infrastructure development have caused tremendous environmental pollution and degradation (Chopra *et al.*, 1993), which ultimately disturbs the equilibrium between humankind and nature, thus sustainability. Consequently leading to the regulatory mechanism through state sponsored actions by

formulation of Environmental Impact Assessment (EIA) as a legal requirement for upcoming development activities by the Environment Protection Agency (Biswas, 1996).

In India, EIA was introduced during 1994 (MoEF, 1994) after realizing the environmental threats mainly from industrialisation. The main causes of these threats ranges from poor governance, rapid economic reforms, and favours to small-scale units. Hence, EIA should be integrated into all those industries, which has direct and indirect threats to the environment through establishing coordination between various government authorities involved in planning, execution and implementation work (Paliwal, 2006).

Environmental Impact Assessment (EIA) is an efficient method for preserving natural resources and protecting the environment. It involves individual assessments of aspects of environment (e.g. population, landscape, heritage, air, climate, soil, water, fauna, and flora) likely to be significantly affected by a project (Morris and Therivel, 2001). It is thus anticipatory, participatory, and systematic in nature and relies on multidisciplinary input (Glasson *et al.*, 1994). This made, EIA a management tool to be linked closely with the project life cycle to ensure that appropriate environmental information is provided at the correct time (Wood, 1995, EPA, 2007). It also ensures integration of environmental concerns in decision making (Feldmann, 1998).

Bowles (1981) defines Socio-economic Impact Assessment (SIA) as “the systematic advanced appraisal of the impacts on the day to day quality of life of people and communities when the environment is affected by the development or policy change”. Hence, SIA with integration into EIA can be seen as a tool which aims to integrate environmental considerations into laws, policies, plans and programmes (Rabel *et al.*, 1996; Clayton and Sadler, 1998).

Tourism is one of the world’s largest and fastest-growing industries with high importance for economic development. It is instrumental for creating unskilled or semi-skilled jobs in service sectors particularly in hospitality management such as hotels, resorts etc. It also facilitates secondary employment in various supply industries and therefore provides means of poverty alleviation. Tourism being largely a natural resource based industry affects air, land, water and the immediate society. Tourism in mountainous region with rich attire of range of environmental resources (e.g. species habitat for ecotourism, snow cover for skiing, river for rafting, waterfalls, etc.) are highly attractive, and determine volume and quality. Invasion of tourist in remote areas for eco-tourism purposes may provide opportunities with better quality of life by money flow and creating awareness among locals through interactions. Presently, tourism shapes as industry and governments observed as an appropriate sector to create jobs, international income and to stimulate regional development (Hall, 1991). As per estimates, eco tourism market makes up 6% of the GDP all over the world with yearly growth rate of 5%.

Tourism influences the host community by two ways: the tourist–host relationship and the development of the industry itself (Ratz, 2002). This may inflate the cost of facilities and materials due to high demand raised by inflow. Primarily, tourism in developed region carries a series of negative impacts such as increased cost of living, traffic congestion, pollution, infrastructure deterioration, and an overall stress on local facilities (Hohl and Tisdell, 1995). The seasonality dependence (i.e. peak periods of tourism) has also adversely impacted the spatio-temporal environment because of the intense pressure on fragile resources (Petrosillo *et al.*, 2006). Therefore, if tourism is to offer a sustainable development and poverty alleviation, proper planned policies are to be devised to ensure that the benefits are shared

and spread among poor communities without making them more vulnerable (Anonymous, 1997) with minimise the adverse impact of tourism on the environment (OECD, 2008).

Tourism on the banks of River Ganga in Uttarakhand, India has become a double edged activity due to the influx of tourists and lack of proper implementation of rules and regulations. Though it has a potential to contribute towards social and economic achievements, but unsystematic and uncontrolled growth is paving path for the degradation of environment and loss of local identity along with the traditional culture (Farooquee *et al.*, 2008). Substantial leakage from the region of rafting-related expenditures also hinders the maximization of local benefits and is a constraint on overall economic development. Therefore, examination of attributes of economic impacts can highlight deficiencies and constraints that limit the economic benefits of tourism such as rafting industry (Hjerpe and Kim, 2007).

The present study will therefore be helpful in identifying the location specific impacts of river rafting particularly on socio-economic status besides generating baseline information. The mitigation measures will also be elaborated in the overall context of regional development. This will address the gap for the policy instruments particularly for remote locations with plenty of natural resources.

2. Profile of Study Region and River Rafting Industry

2.1. Profile of Study Region

The study site is situated along the Badrinath National Highway on river Ganges, district Tehri Garhwal, Uttarakhand, between 30°04'23"–30°07'34"N latitude and 78°30'13"–78°19'48"E longitude; popularly known as "Kaudiyala – Tapovan Ecotourism Zone". The area covers a road distance of 40 km along with a river transect of 36 km from Rishikesh city. The paths are serrated by deep gorges, reverberating with the gurgle of innumerable streams. Emerald green dense forests containing Sal (*Shorea robusta*), Kanju (*Holoptelea integrifolia*), Bakli (*Anogeissus latifolia*), Dhauri (*Lagerstroemia parviflora*), Bamboo species and others cover both sides of the highway in gorges and hill tops.

The region lies at external range of the Middle Himalaya Mountains and comprises of Shivaliks. The unexplored valley, towering peaks, flowing rivers, snow-capped mountains along with a splendid combination of flora and fauna including vast tracts of virgin snow add to the exquisiteness of this place. Thus offering excellent venues for adventure sports such as skiing, river rafting, canoeing, para-gliding and rock climbing. Nevertheless these mountains around Tehri are a big decisive factor in the weather and climate of this region. The summer temperature ranges between 9°C - 30°C and winters temperature ranges between 3°C - 15°C with average annual rainfall of 70 cm. In rainy season, climate is very cool and full of greeneries. The summer is very pleasant with the harsh mountain sun balanced by the mesmerizing air flow. The winter is very harsh at times with severe cold draughts all over the Tehri Garhwal region (<http://www.bharatonline.com/uttarakhand/tehri-garhwal/weather.html>).

2.2. River Rafting and Camping on Ganges: A white water sport

White Water rafting is one of the challenging adventures where one hurtle down a pumping river with sheets of water crashing aboard an inflatable raft. It is generally practiced in the undammed river stretch through a canyon or other narrow area with obstructions that create

rapids. The white water rafters seeking adventure shell off uncertainty of life in order to enjoy the river wilderness. With the intricate network of mountain stream flowing through a myriad of different colours of rocky gorges, forests, flowers and high mountain villages, the hills provide ideal locals for the perfect water adventure. The sport of white water river rafting is a triumph over the swift, swirling river as it gushes past spectacular mountains (<http://en.wikipedia.org/wiki/Rafting>).

The Himalayas, stretching 3,200 kilometres along India's northern frontiers, cradle numerous rivers with slopes which drain them all year round. These abundance of mountain rivers make these locations as white water destination, with plenty of first-descent and exploratory possibilities. The development of river rafting as a leisure sport has become popular since the mid-1970s. The initial beach camps on Ganges have been established during 1988 for camping purpose by the regulatory authority permission i.e. Ministry of Environment and Forestry, Government of India (GOI).

In India rafting is commonly exercised on the River Ganges near Rishikesh and the Beas River in Himachal Pradesh. Meanwhile Rafting on Ganges is certainly an unusual experience; due to the presence of nature's mystique beauty and presence of five rapids which makes rafting heaven. Every year after rains, sand gets deposited to make clear and distinct formation of beaches on both banks of Ganga. In recent times this area has been denoted as an eco-tourism zone namely Kaudiyala-Tapovan eco-tourism zone where various activities besides rafting and camping have been permitted. River rafting in Uttarakhand started during last decades of the twentieth century and has rapid growth.

The Rafting Industry on the Ganges was became regular phenomenon since 1994 with only four entities. Now, total operational entities were 74 with 208 numbers of rafts afloat during 2008-2009. The government departments, local shopkeepers, immediate villagers are main stakeholders for the industry. The Eco-tourism zone, include villages like Byasi, Kaudiyala, Singtali, Timli, Bawani, Brahmapuri, Guller, Shimpuri, Mala, Kathya, Bawani, Silan etc. The permanent assets of the camp include rafts, vehicles, tents, furniture, utensils etc. whereas the temporary assets include vegetables, grocery, wood, fuel etc with range of employees from manager to helpers.

3. Method

The basic approach for the study comprises collection of various primary and secondary data from field surveys and government records. With the intention of comprehending the discernment of local people about all possible positive and negative impacts of river rafting and camping, we visited nearby villages and had discussion with the elderly mass, shopkeepers, children and youths to visualise their perception. In the process, we also held series of discussion with the camp owners, managers, workers and labours of the camp to have unbiased information about the state of affairs.

The primary survey was conducted using a questionnaire, followed by informal and formal meetings and group discussions with the camp owners, stakeholders and villagers. For generation of information, various aspects of the industry were appended in the questionnaire to take into account of the relevant issues by means of suitable indicator. This facilitates the generalisation of impacts on the society, environment, wildlife and bio-diversity. Secondary data regarding the number and area of the camping sites, number of tourists visiting and other relevant information were collected from the State Forest and Tourism Department.

4. Results

4.1.1 Present scenario of Rafting Industry

This industry has vast potential of growth keeping in view of stretch of river Ganges, environment and location. Probably, it is the reason that the total camping area on Ganges in this zone has increased up to around 1,80,000 m² from 2,000 m² in 1994-95. This growth signifies that the industry is increasing with leaps and bound to cater the intend needs of visitors. It facilitates the increased revenues to owners without proper attention to the management of local resources. It is being analysed in more lucid way in following paragraphs by considering the social, economic, environmental issues with emphasis on social values.



Source: Office of DFO, Muni-ki-Reti, Uttarakhand, 2008

Figure 1: Temporal growth of camping area on the Ganges

4.1.2 Institutional Norms and Actual Practices

The regulation of tourism has also been planned out for proper and equitable resource distribution. However, the effectiveness is jeopardized in the absence of proper implementation. The norms with present practices are being discussed in brief.

4.2. Economic Transaction

4.2.1. Financial analysis of camp

Rafting, kayaking and camping on the River Ganga from Kaudiyal to Rishikesh are regulated by the State Forest and Tourism departments. However its functioning is also subjected to fluctuations in the weather and climatic conditions, local people of the area, camp owner and workers as well as the type of tourists. The camps are functional for 9-10 months in a year

and remains closed from June end onwards till September because of high wind and heavy water current due to the prevailing rainy season along with unexpected and sudden change in river flow, volume and speed in this period.

The camp owners had to pay taxes of around Rs 20,000 – Rs 30,000 rupees as a lump sum on account of beach permit to the State Forest Department till the 2008-2009 for a rafting season or on Rs 3-5 per square feet basis. However from 2009-2010, the permit tax has been raised up to Rs 60,000 - 70,000 as lump sum or Rs 8-10/square feet basis. A raft tax of Rs 2,500/raft is levied and paid to the State Tourism Department as well as the Forest Department for one rafting season.

INSTITUTIONAL NORMS	PRESENT PRACTICES
No light is allowed beyond 9 pm in the night so that the surrounding wildlife is not disturbed.	People were found to use various sources of illumination and hence, rules were not followed judiciously.
Music and bursting of crackers are totally prohibited in the camps so as to minimise disturbance in the forest area and prevent forest fire.	As perceived from the local people, tourist were found using high sounding music and sound of crackers were at times heard from the camps proving the rule to be disobeyed.
Toilets are permitted in the form of dry pit tanks situated 60 m away from the sand bank so as to prevent water pollution.	Most of the toilets are not more than 10 m away from the sand banks & within submergence levels of the Ganga.
Camp fire is only allowed on a metallic plate and not beyond 11 pm. The ash is to be disposed in municipal dustbin.	Care is less taken about the prescribed conditions and even time limit is not exactly followed.
The use of any kind of detergent is prohibited; it also includes washing of clothes and utensils.	From group deliberations and during our survey of camps, people were found washing utensils using detergents and spilling the sullage over the sand.
Fishing is prohibited.	From our visual observations some tourists were found with fishing rods.

For buying of permanent assets which include rafts, transport vehicles, camping materials and furniture the owner expends a sum of around Rs 15-20 lakhs. In the form of temporary assets money is spent in buying fuel for transportation purpose, vegetables, firewood, gas, utensils, grocery and others which amounts to approximately Rs 5-8 Lakhs rupees a season, as revealed. Subsequently payments were made to the employees at the charge of Rs 6,000 – 10,000 for managers of the camps, Rs 4,000 – 8,000 for river guides, Rs 3,000 – 6,000 for cook or driver, Rs 1,500 – 3,500 for caretakers, helpers or labours. Therefore, it can be summarised that the owner spends around Rs 10-50Lakhs a season depending on the type and size of the camp.

From personal discussions it was found that the number of tourists coming for rafting varies from 1500 to 4000 per season, amongst whom 32% were foreigners and the rest 68% were Indian tourists. Even the package of the tour (which normally includes 2 days and 1 night halt) was found to range between 800-3500 depending upon the distance of rafting and type of treatment (i.e. Deluxe type/Hi-tech type/ Normal type). Thus it was found from our surveys that the owner's income ranges between rupees 40 Lakhs to 1 Crore a season depending on various factors. After the entire it was found that profit gained by the camp owner ranged something between 15 lakhs – 50 lakhs per season.

4.2.2. Economic Impact on Locals

In River rafting industry, the percentage of immediate local people/villagers employed is only 35%, while people from rest part of Uttarakhand is 40%, and rest 20% is from other parts of India. The employment of immediate locals is less and mostly for low paying positions. It is probably due to lack of sufficient skill with the local people against the demand of the industry. The survey reflects that the owners do not fulfil commitment to the locals. It is probably due to their perspective that these locals may remain pre-occupied among themselves for their household chores, thus restrict the functioning of the camp. Secondly, they apprehended against the rise of malpractices. The results are suggestive for measures needed to be taken for addressing the issues of owners and accordingly training the local people to meet the demands of the hospitality and services management.

While surveying it was also found that at some place people have sold their agricultural lands forever at the rate of Rs 6 – 8 Lakh rupees whereas some have given their land on lease basis for around Rs 90,000 to Rs 1,20,000 for a season of ten months. Similarly some people have given their houses on rent for Rs 2,000 – Rs 4,000 or sold it off completely for a sum ranging between Rs 4-5 Lakhs.

Though buying of local products such as vegetables, milk etc. by camps could have been potential means of economic gain for local people but the direct procurement of all these necessities from city by camps renders this means of economic profit to the immediate villagers obscure though.

Furthermore indirect means of income generation options have also grown up. It mainly includes selling of refreshment items i.e. tea, cold drinks, chips and others. However this means of economic benefits due to the presence of Rafting industry is low in numbers and can be accounted to only about 10-15% of total benefit earned by the shopkeepers. Nevertheless a rare means of economic gain is achieved by selling of collected firewood for the purpose of bonfire at the rate of Rs 100- 200 per *kattha* (about 20-25 Kg).

Therefore direct economic benefits from river rafting industry are accountable but still can be increased by various means in lieu of community interest.

4.3. Social and Cultural Impacts

The advent of white water rafting and camping has brought this pristine area of Uttarakhand under the lust of human desires. The region is as such under considerable pressure due to the ever increasing demands made by local populations on environmental resources. Local energy requirements for heating and cooking, timber for construction, and the grazing and

forage requirements of livestock often translates into a heavy demand on the dwindling forest resources.

4.3.1. Impact on Education

It was found though small in volume with occasional activities that school going children escape their schools and run errands to get a paltry sum to please their fluttering minds. This distracts the children particularly male of unprivileged poor family from education. Hence, education may be on back track though little in the region, which falls under poor literacy rate circle.

4.3.2. Impacts on Lifestyle

Direct and indirect interaction of host with local and foreign visitors influences the life style of people of these mountain communities. Senior members of the community were in view of the changing attitude of the adolescent males in some immoral activities with lust of earning money rapidly. It was mainly better life style of tourists, who are generally from a cosmopolitan background and have a mix of western lifestyle. In a few cases smoking by the female tourist and there skimpy outfit has put some challenges into the rural lifestyle of the youth, as revealed by the elders. Even the intimacy between male and female tourist friends is also instrumental for slight and hidden but observable change in the lifestyle of the local young masses.

Moreover the prodigious ways of the tourists fosters a covetous feeling among the young mass. Consequently, they migrate in lust of higher earnings or else feel sullen and remain in disturbed mindset. Besides, some beneficial impact on the lifestyle was visualised in form of monetary help given by the tourists for one or the other cause i.e. education etc. However, among the villagers there was a strong feeling that the lifestyle change is not being beneficial to the local life and if continued in the similar manner may alter the society drastically.

4.3.3. Impacts on Amenities of Social services

Our survey established that only 18% of the camp owners provide some kind of social services which includes first aid mainly, giving small economic grants to local school. Thus the local villagers at those places were a bit satisfied with these benefits given by the river rafting industry. Hence, if most of the camp owners would think of giving some or the other kind of social benefit to the local villagers then the region would also get a chance to prosper easily and even it would create a good bondage amongst the camp owners and stakeholders. It indirectly, hinders the free movements of domestic animals for grazing due to traffic flux.

4.3.4. Impacts on Social Cohesion

From our survey and discussion with people of different age groups, it was found that preference for traditional food was decreasing; a lust for earning money was haunting the mind of the youth thereby causing increased number out migrations. Even education of small children was suffering and some instances of family break ups for property and money were also overheard. Thus we could conclude from the statements of the local people and our survey that social cohesion in this region is not taking a positive pathway.

4.4. Impacts on fauna and environment

4.4.1. Impacts on Terrestrial Fauna

With the advent of white water tourism in Uttarakhand, The fragile ecosystem of this region is threatened particularly the forest ecosystem. The anthropogenic intrusions endanger the wildlife of this region. This activity started growing regularly and with due course of time in the favour of economic gains, the wildlife was not at all taken into account. As per the reviews collected, the animals didn't prefer to come down for either drinking water or in search of food during daytime as human activity is intense during this period leading for a preference of night time. Hence, a behavioural shift from diurnal to nocturnal habits is expected in this region. Even animals like leopards and bears due to the shift in habitat attacked the livestock of villagers during night as they were tied to one place and thus easy to devour upon. In return the villagers become violent and set traps to catch them.

However close interaction and not exactly conflicts have been undertaken by 59% of the people in the camps surveyed. Though, incursions into the camps are not heard but they are not even far off distances which may thereafter pose a threat to human life. Hence, if mitigation measures are not taken instantly and left unseen then perhaps this ecotourism zone may come amongst the hot spots of man wildlife conflict.

4.4.2. Impacts on Aquatic Fauna

In another instance kitchen refuse (mostly leftover food) tends to be a source of diet for some of the aquatic lives which might seem good for certain period of time but in the long run they become vulnerable to human lust and joy. Even the varied kinds of pollution ranging from dumping of solid waste to faecal waste will pollute their living environment and force them to undertake various adaptations.

4.4.2. Environmental Impacts

Most of the populaces were aggrieved with the drunken revelry of tourists and profanity towards the holy river as they; throw polythene, wrappers and various kinds of bottles into the river creating a bad impact on their immediate serene environment. Even the matured adults and the old age people were of strict belief that Ganga is being polluted by use of detergents for washing utensils, soap and shampoo for bathing purposes.

In the camps, many discrepancies were observed with respect to the various environmental conditions. For instance, the toilet in camps, most of them were of dry pit type and are situated within the submergence zone of the Ganges. Consequently during rainy season the dumped faecal matter flows along the lofty water current causing a voluminous rate of pollution just at the starting point of this river. Even this industry is growing every year thus in forthcoming days, the pollution will keep on rising if unchecked.

Similarly along the corridors of national highways solid waste including wrappers, plastic and wine bottles, rugged footwear and many others were found untreated and lying on the roadside as well as on trekking trails amid forests which was solely generated due to the rafting and camping industries.

Assisted by polythene pollution, it was found when tourists use the same trail over and over again; they trample the vegetation and soil, eventually causing damage that lead to loss of biodiversity and impacts on regeneration.

During our meeting a mass of school teachers were of the view that time is nearing when there will surely be a fight over drinking water supply in the region because as such water supply is very less in amount and is being exploited by the camp owners.

The increased vehicular transportation in this area for tourism has contributed a lot for local air pollution as well as contributes to climate change. Noise pollution from cars, and buses causes distress to wildlife.

5. Discussion

The study provided many useful insights into the various impacts of river rafting in the Kaudiyala–Tapovan Eco-tourism zone. Summary of impacts have been enlisted, which depict the developmental and scenario of trouble for the region (Table 1). However tourism is a risk agent that can have adverse impacts on socio-ecological systems also (Zurlini *et al.*, 2004). Thus along with the positive economic impacts that tourism and recreation can have on rural areas, a cadre of negative social impacts can be created as well (Hjerpe and Kim, 2007). Similarly in this case there were various social problems of different magnitude. Again many of the jobs created by rafting in the Grand Canyon however, are lower wage and bring little diversity to a regional economy (Hjerpe and Kim, 2007). Conversely from our study it was found that mostly the number of immediate villagers engaged in this industry was as such less and even jobs they were given are of low category thereby not bringing a great range of difference in regional economic growth. Farooquee *et al.* (2008) have also a similar opinion that if the norms as laid down by the government are well followed by the operators, it can minimize the negative environmental and cultural impacts of this activity. Along with it proper implementation of the norms should also be regularly monitored for bringing about a sustainable development. Eco-tourism impacts on the environment and society may be addressed through management and control (Petrosillo *et al.*, 2006).

On the same lines due to the River rafting Industry on the Ganges, the economy of the government is well enhanced in a positive direction, the camp owners also gain a handsome amount from each season. Along with certain economic gains, there are many ways by which these positive impacts can be increased to a greater extent. As observed at Shivpuri, one of the camps named ‘Snow Leopard’ creates social bondage with the local people by helping them at health level concerns. The camp owner has built a small dispensary named “Ganga First Aid Centre” where first-aid to villagers is as such available along with it they are allowed to consult with a physician at a nominal entry fees of ` 5/-. Thus people at those places are happy enough.

The study also shows that international tourists who account for around 32% of the total tourists visiting this region also play a major role in the development of this industry and influence various social pros and cons. Similarly, air pollution and loss of bio-diversity by various means is prominent from the study.

During the survey it was also observed that dispute might arise in near future with respect to use of natural resources of that area which may include water supply or cleanliness of the surrounding River Ganga. Even the want of having a greater say in the economic gains by the

local people through means of river rafting may also result in conflicting situations between camp owners and the local people. Therefore policy recommendations are focussed for increasing the regional retention of rafting expenditures and for understanding both the beneficial and adverse impacts that accompany outdoor recreation in rural areas (Hjerpe and Kim, 2007).

Table 1: Summary of Rafting and Camping Activity Impacts

Aspects	Positive Impacts	Negative Impacts
Employment	Provide employment to people including locals	As such no negative impact keeping in view the large population
Enjoyment	A source of enjoy to the tourists	Loss of some nearby vegetation, though chances are remote
Education	May be due to income opportunity and other association with highly educated tourist, which may be instrumental	Chances (remote) of child labour though act prohibits it.
Income	Indirect sources of income i.e. selling of lands, selling of refreshment items etc.	No effect
Life Style	Positive impacts though present are overridden by the negative ones	Development of bad evils amongst a few due to improper understanding of the situation
Culture	Increased sense of belongingness to the area	Shift of traditional values and culture
Wildlife	Indirectly facilitate for development through public awareness	Habitat loss, disturbances, Remote chances of man wildlife conflicts
Solid Waste	Sense of aesthetics is developed near the camp	Pile of garbage from tourist
Water pollution	Not visible	Disposal of waste and open/submergence zone defecation into the river
Air Pollution	Not visible	Increased vehicular emission
Noise Pollution	Not perceivable	Increase in traffic and tourist pressure
Regeneration Loss	Not accounted	Regeneration in forest ecosystem is diminishing, in lieu of trails creation and disposal of mainly plastic wastes

Finally this study can be improved by help of the model (Figure 2) developed below for socio-environmental impact assessment and rigorous efforts if made by various Government and non-government organizations by quantifying impacts, some of which were discussed in the present context based on visualisation and rapid survey. However the final output of this research is instrumental in identifying the areas that has to be given prime importance for a full-fledged analysis.

6. Conclusion

Rafting contributes to the economic growth of the region. Further, it may play a role in promoting environmental awareness indirectly; by experiencing firsthand beauty of a river, individuals who would otherwise be indifferent to environmental issues may gain a desire to protect and preserve that area due to their positive outdoor experience. Moreover, the river rafting industry may contribute to the protection of rivers from hydroelectric power generation, diversion for irrigation, and other such developmental activities.

The integration of information of various components provides a well-balanced understanding of the community's make-up in terms of all surrounding resources (i.e., social, economic and environmental). Collectively, these resources are important in guiding the community decision-making, goal-setting, and planning process towards achieving sustainable growth strategies. In this context, economic achievements must be compatible with environmental protection and social values and vice versa.

The study emanates that social disturbances in the region were increasing and promoting loss of traditional values. The effects may be low at present but if not checked, in due course of time the local identity and traditional values of this region may be challenged, however the exposure experience and social progress may balance the impact, if not influenced rapidly. Similarly, pollution due to increased vehicular emissions, traffic congestion and unplanned constructions are adversely impacting the society and pose threat to change in local climate.

Therefore like all wilderness activities, rafting must balance its growth economically, culturally with the conservation of bio-diversity and environment around it as a natural resource and habitat. Hence, a sustainable means of developmental approach should be undertaken by the government through implementation of some strict rules, making the raft and camp owners aware about their social responsibility towards the local people and making it perceivable to the villagers.

It can thus rightly be argued that the expectations from the development of River Rafting and Camping industry on the banks of The Holy Ganga have not been up to the mark. The high inflow of tourists, passiveness towards social and environmental concerns accompanied with lack of proper implementation of rules and regulations have accounted for the same. Also the fast and sometimes uncontrolled growth is leading to the degradation of the environment and loss of local identity and change in traditional culture which threatens the social life of the people. Therefore it's potential for a sustainable development in this Himalayan region is taking a negative path. Thus there is an urgent need for comprehensive impact assessment studies before the future goes out of control.

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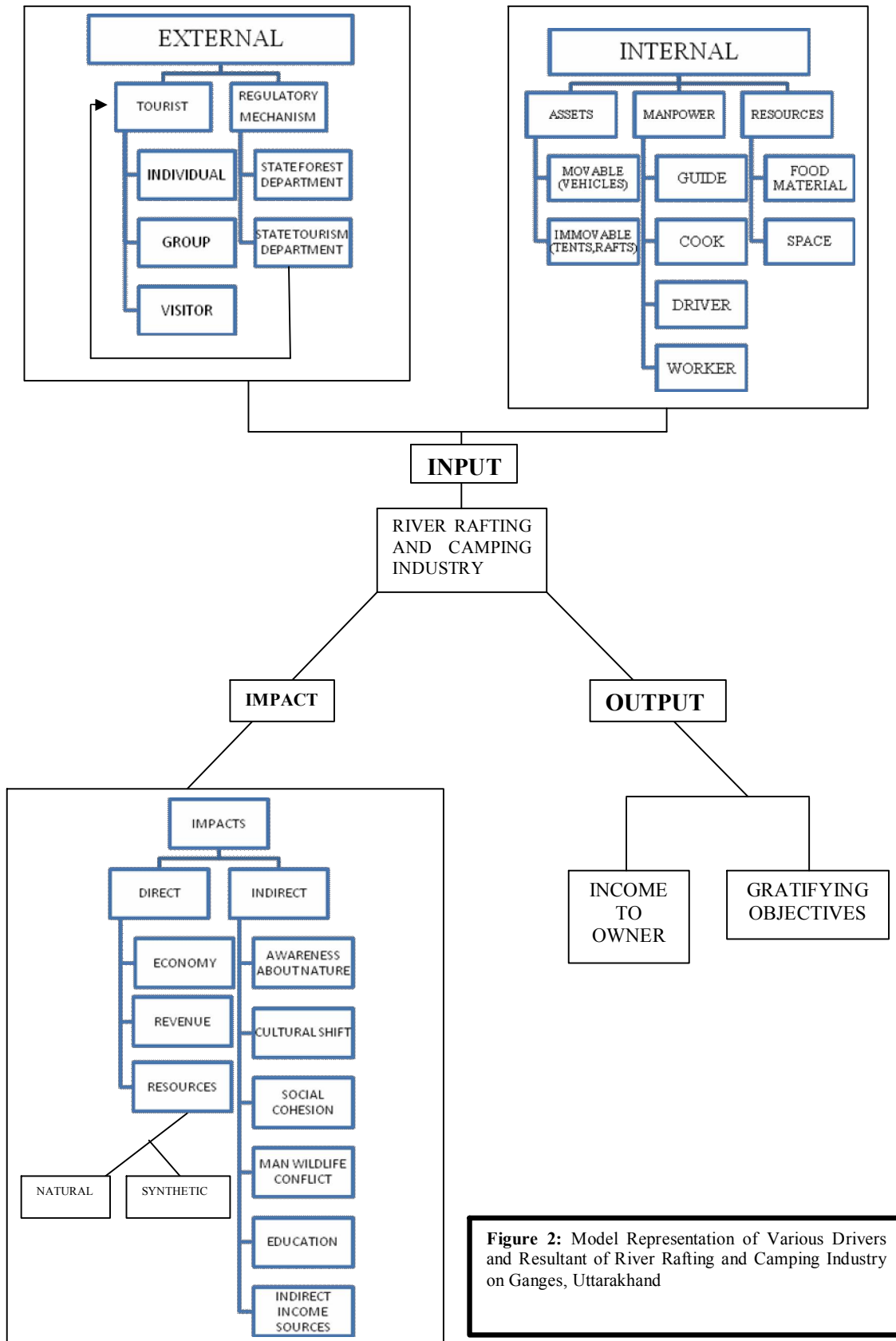


Figure 2: Model Representation of Various Drivers and Resultant of River Rafting and Camping Industry on Ganges, Uttarakhand

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