



Socio-Economic and Environmental Impact of Tourism in Kodagu District (India): A Case Study

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Abstract:

Kodagu district has internationally recognized as one of the environmental “micro hot spot” due to the biological diversity and distribution of the Western Ghats. Unique culture heritages of the area have made ideally suits for tourism and a most attractive recreational spot in the country. The present study deals with an impact of extreme tourism on the environment and socio-economic conditions of the district. An impact assessment study was carried out by sample survey method at major tourist places of the district. The study shows that tourism has made substantial contributions to the livelihoods of local communities especially on socio-economic conditions. The study is explored serial consequences of tourism on the local environment and socio-economic conditions of local communities by pollution, waste disposal, threatening to wildlife, over utilization of endemic species and income outflow, etc. The study contributes to the knowledge and information on the current status of tourism vulnerability and diverse opinions on the conservation in among the local communities.

Keywords: Biodiversity; Environment; Hot spot; Kodagu; Livelihood; Socio-economic; Tourism.

1.0 Introduction:

Tourism has emerged as the world’s largest industry (Richard 2006; Cizmar et al. 2007; Sarhan et al. 2004) and largest service industry in India with a contribution of 6.37% national GDP. In 2010, total foreign tourist arrival in India was 5.78 million and India has generated about 200 billion US dollars in 2008 and that is expected to increase to US\$375. 5 billion by 2018 at a 9.4% annual growth rate (Ministry of Tourism, 2012). Increase in human population and preferences for leisure activities often leads to an increased demand for recreational use of environmental amenities in many parts of the world. Growth of interest in sustainable economic development and tourism business, particularly tourism impacts on the environment and socioeconomic issues is the conflict (Meduna et al. 2007; Eagles 1992; Varghese 2008; Mulder et al. 2006; Krithi 2007; John 1994; Forest survey of India 1995; Ghulam et al. 2013; Joseph et al. 2003) Karnataka is the eighth largest state and it has been ranked as the fifth most popular state in the country

for tourism and recreational activities due to the distribution of Western Ghats. The Western Ghats range is internationally acknowledged as an ecologically important region because of its rich biological diversity and effects of human depredation (Department of Karnataka tourism 2008; Georgina 2010). The topography of Kodagu district has a mountainous configuration with valleys and ravines and agriculture is the only significantly developed sector and in addition to that the district is a gift of nature. This area is an attractive tourist destination in the southern part of India and its natural resources, ecological advantages and situated in an important geographical nerve point are a great pleasure for development of tourism in the district. Kodagu is a host of tourism treasurers to offer tourism like lakes, rivers, hills, forests, wildlife, tribal life, archaeological remains, including historical monuments, folklore, religious and cultural heritage, handicrafts and much more. Most importantly the place has rich in cultural heritages which differed remarkably from region to region. It is possible to

point out that natural, historical; ethnic, cultural, and vacationing attraction are the major tourist attraction categories in Kodagu. It is one of major world's 25 hot spots in biodiversity and covered 80% greenery of the total land with $\approx 10\%$ of protected forest and $\approx 33\%$ reserve forest and private forest. It is home to three types of forests such as evergreen; grass and semi-evergreen and grows 36% of total plant species in Karnataka and 8% in India. Total 1,332 plant species grown in Kodagu, 53% of them have medicinal value and the unique varieties of medicinal trees Pannampuli, Peenari and White cedar are grown in Kodagu, which are in great demand for research studies. According to a survey that spanned 1910 to 1982, 26% of the land was under cultivation and 35% under non-cultivated area (Bhagwat et al. 2005; Madhav 2004). This gives a position of the most attractive place for tourism destination in the country. The outcome of the research has provided a better understanding to impacts of tourism on environmental health and socioeconomic conditions of local communities in Kodagu district.

2. Material and Method:

2.1. Study Area:

Kodagu has a greatest length from the Hemavathi river in the north to the Brahmagiri range in the south is about 96 kms. Its greatest breadth from Sampaje in the west to Kushalnagar in the east is about 60 kms. Kodagu, commonly known as Coorg and it is the second smallest district in Karnataka state, occupying an area of 4108 sq.km and with 30 - 35 percent of the Western Ghats. Its population is 5,54,762 as per 2011 census. The district has a mountainous configuration which presents a grand panorama of verdant valleys, ravines, fast flowing streams, lofty peaks and awe inspiring spurs. The major peaks are Tadiandamol, Brahmagiri and Pushpagiri hills. The largest river in Kodagu district is the Cauvery with its principal tributaries Hemavathi, Lakshmanathirtha, Kakkabbe, Barapole and Survanavati. The climate is cool, equable and pleasant, it has very moist rainy monsoon. Talacauvery, Abbi falls, Erpu falls, Mallalli falls, Nisargadhama, Harangi back water, Tadianda Molu & Makutta, Nalkunadu palace, Raja seat, Raja gadduge, Omkareshwra temple, Lakshman teertha, Sangama, Nagarahole national park, Mandalapatta, Dubhare elephant Forest, Anechokur, Bhramhagiri and Pushpagiri hills are the important tourist places in the district.

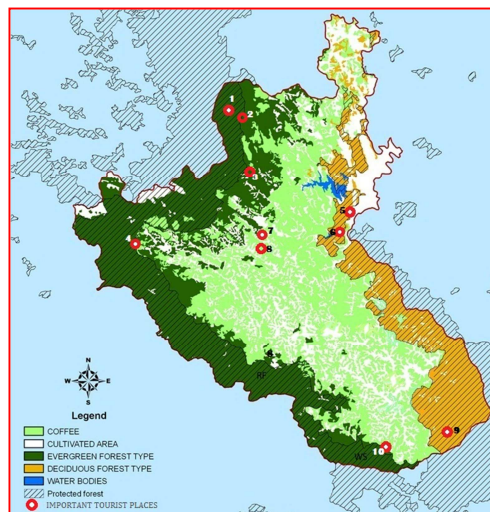


Figure 1: Important tourist places selected for the study in Kodagu district: 1. Pushpagiri; 2. Mallali Falls; 3. Mandalpatti; 4. Talacauvery and Bhagamandala; 5. Cauvery Nisargadhama; 6. Dubhare Elephant Camp; 7. Abbe Falls; 8. Rajaseat and Omkareshwara Temple; 9. Nagarahole National Park; 10. Irpu Falls and Lakshmana Thirta.

2.2. Methodology:

The tourism impact study was carried out by a field survey method using a specially designed questionnaire for a period of 6 months from September-2013 to February-2014 and 10 important tourist places (Figure 1) were considered. Information relating to the impacts on the environmental and socio-economic conditions in the district was collected by local peoples and other native communities in and around the tourist spots. Local service providers (transportations, shop keepers, resorts, lodges, hotels and home stay), farmers, and tourists were also considered as target people during the surveys. Questionnaires were designed in such a way that all probable impacts variables caused by tourism activities on socio-economic and environmental conditions with attributes in english and local language (Kannada). During the survey, specially designed questionnaires were distributed to the target group and collected feedbacks relating to the health, welfare, culture, living style, employment, income, cost of living, infrastructure, and education were considered as important variables during the impact assessment of the socioeconomic condition of the local community. Environmental pollution, loss of biodiversity, solid waste generation rate, resource depletion and removal of green cover (deforestation) were

considered as important environmental variables during the studies. The conclusion of the present study mainly based on attributions of the personal observation, opinion and information given by targeting groups, local people and field survey.

3. Results and Discussion:

The study potentially bears an interesting ramification on unpleasant tourism activities at important tourist places and its impact on the environment and socioeconomic conditions. Preliminary studies showed that the total numbers of tourists visit in some places like Tala Cauvery, Raja Seat and Abbi Falls have reached up to 1.2 lakh per month in Kodagu district.

3.1. Environmental Impacts:

Abundant tourism activities in highly sensitive and ecologically pompous regions will cause considerable impacts on environment and causes rigorous environmental risks. The impact magnitudes of tourism, mainly depend on the intensity of tourist activities. The study showed that 80-95% of major water resources are polluted by tourism activity and also same opinions have expressed by other research studies on water pollution in the district (Krishna et al. 2012; Divya et al. 2013; Venkatesha et al. 2013; Vishwanatha et al. 2014; Bhatnagar et al. 2009). Throwing of coins and stuffs by the pilgrims and tourists into the water bodies was observed in the name of religious activities in Talacauvery and Bhagamandala. Most of the pilgrims who involved in religious sacred bath and swimming in some places were suffering from skin and other infectious diseases. A Cauvery river origin point is rigorously polluted by pathogenic microorganisms and other pollutants during recreational and religious activities of tourists. Most crucial activities of tourists like swimming, bathing, dumping of solid waste (food packages, plastic bags and water bottles) into the water and washing their vehicles were also observed during the studies. All the interviews were also expressed their opinions like $\approx 70-75\%$ of water resources were contaminated by tourist activities with the contribution of tourist hotels, resorts, lodges, home stays and health services. The present survey also confirmed that about 35-40% solid waste generation rate is increased by tourism activities and solid waste accumulations was observed all over the tourist places and roadsides. Due to large amount of solid waste disposal and lack of infrastructure, 75-70% of the solid waste generated is disposing

inappropriate manner and such unhealthy dispose includes open burning which further causes environmental and health risks around tourist places (Da Zhu et al. 2007). The natural habitat is destructed by enormous tourism, which is threatening the existence of endemic species, green cover, local aesthetic value of biodiversity and wildlife etc. in the district (Figure 2a).

Due to busy tourism, consumption of local resources like water, wood, land and food as well as herbs is gradually increased and the study indicated that directly or indirectly, tourism has promoted approximately 21% and 7% of deforestation and landslides and few studies have reported regarding in the district (Georgina 2010). Tourist's activities like fire camps, eco-trekking, consumption of bamboo shoots and rooted herbs are impacting on biological resources. The present study showed that consumption of bamboo shoots and rooted herbs by tourism leads to $\approx 10-12\%$ removal of green covers in the district. Illegal selling of bamboo shoot, rooted herbs and forest products which are majorly depending by the wildlife in the forest was reported and those products are in greater demand due to enormous tourism. It clearly reveals that the indirect effect of tourism on food production rate and herbivorous wildlife like elephants, antlers and deer etc. by disturbing natural food chains. During the survey local people were expressing their sorrow for high level of landslides, soil erosion and natural habitats in major tourist places in the district due to the tourism developmental activities like construction of roads, resorts or stay home, transportation facilities, etc. and also same impacts have been reported in earlier research studies on landslides in the district (Vishwanatha et al. 2014; Claude et al. 2007; Madhav 2004; Karnataka Biodiversity Board 2010).

The survey confirmed that considerable impact of tourism on ecologically diverse areas like Pushpagiri, Mandalpatti, Dubhare Elephant Camp and Nagarhole National Park. Most crucial impact observed in those eco-tone areas were disposing of plastic wastes and their accumulations which further restrict the habitation of endemic and endanger species. The study implies disturbed life span of wildlife and endangered species by organizing fire camps, trekking, boating, fishing, river rafting and musical disco etc. by tourists around habitats of wildlife. Over utilization of vehicles and staying in

staying home by tourists within the eco-regions are also affected on the life span of the wildlife and endangered species. Continuous threaten of the wildlife and other species by tourists with cameras, using of elephants for entertainment, rides and other activities without following the precautions at national parks and reservoirs are the other consequences of tourism. Availability and demand of dishes made from the local divers species (flora and fauna) at stay homes were frequently reported by the local people. It clearly indicates the critical threatening of the endemic species and illegal hunting of wildlife due to the tremendous tourism activities. Throughout the study we have observed serious impacts of tourism on the environment and its wealth in the district and local people also expressed their regressive opinion about the tourism effect on the local environment. Based on the questioner’s data, tourism impacts on the environment of the major tourist places in the district are tabulated in Table 1. Few qualitative research studies on the individual environmental problem have also revealed the tourism contribution on the environmental degradations at different regions (Baddeley 2004; Budeanu, 2007; Ralf 2009; Beaumont 2001; Frechtling 1994; Kuo 2002). The comprehensive study survey and questioner’s feedbacks showed that about 2-4% of interviewees

from commercial shops, hotels, lodges and travel agencies expressed their opinions as favorable effects to the environment of tourism and few of them didn't express their opinions due to the lack knowledge about the environmental problems by tourism or due to less interested. The data obtained by questioners and field survey revealed that tremendous tourism was contributed overall 37% of the environmental pollution, including water pollution (30%), air Pollution (5%), soil pollution (1.5%), noise pollution (0.5%), which further drives the associated environmental problems. Other major tourism impacts were loss of biodiversity (27%), solid waste disposal (15%), deforestation (7%), resource exploitation (5%), threatening of endangered, endemic and wildlife species (4%), soil erosion (2%), forest fire (0.5%), wild animal poaching (0.5%) and other environmental problems (2%) like irrigation land conversion, man animal conflicts, climate changes, health risks, energy consumption etc. (Figure 2b). Revenue generation was the major advantages of tourism activities in the district, which is utilized for the restoration and management of extinction eco-tones in some regions. The list of advantages and disadvantages the major environmental impacts of tourism activities in the district are tabulated in Table 2.

Table 1: Effect of tourism on different environmental issues at major tourist places in Kodagu district

Tourist places in Kodagu district	Tourism impacts on major environmental factors in Kodagu district				
	Environmental Pollution	Exploration of Resources	Deforestation	Wildlife/ Biodiversity	Solid waste Generation
Pushpagiri	✓	✓	✓	✓	✓
Mallali Falls	✓	x	x	✓	✓
Mandalpatti	✓	x	✓	✓	✓
Talacauvery & Bhagamandala	✓	✓	x	x	✓
Cauvery Nisargadhama	✓	✓	✓	✓	✓
Dubhare Elephant Camp	✓	✓	✓	✓	✓
Abbe Falls	✓	x	x	x	✓
Rajaseat	✓	x	x	x	✓
Nagarahole National Park	✓	✓	✓	✓	✓
Irpu Falls & Lakshmanthirta	✓	x	x	✓	✓

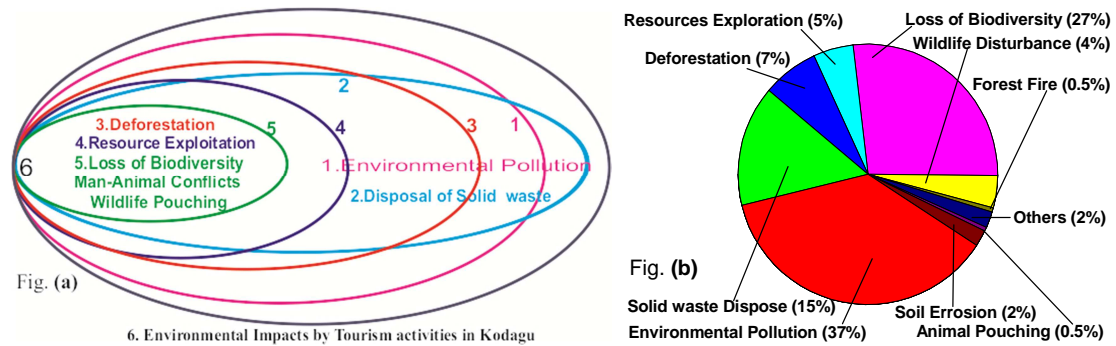


Figure 2: (a) Major impacts on environmental issues and associated problem
(b) Impact's rate on different environmental issues caused by tourism in Kodagu district

Table 2: Tourism impacts on the environment, social and economic conditions in Kodagu district

Categories	Beneficial Effects	Adverse Effects
Environmental Impacts	<ul style="list-style-type: none"> • Provides financial support for the conservation of ecosystems and natural resource management • Making the destination more authentic and desirable to visitors - 	<ul style="list-style-type: none"> • Environmental Pollutions • Solid Waste problems • Landslides and Soil erosion • Destruction of biodiversity • Extinction of endemic and endangered species • Deforestation • Wildlife pouching • Agricultural land conversion • High electricity consumption • Per-capita green area reduction
Economic Impacts	<ul style="list-style-type: none"> • Employment opportunity • Increase in revenue collection. • Increase in household income. • Economic diversification. • Alleviation of local poverty. • More trade for local products. • More value and opportunities to local business and small business enterprises. • Demand for local food and crafts. 	<ul style="list-style-type: none"> • Increase in expenditure cost of environmental protection. • Jobs created by tourism are often seasonal and poorly paid. • Tourism income leaks out into the huge companies or higher class peoples. • Increase in daily expenditure cost for local poor and middle class peoples • Increases the health management cost • Economic distortions due to the shortage of labors for agricultural activities (both in quantity and quality) • Employment distortions by employees from other areas or by migrants • Increased land price

<p>Social Impacts</p>	<ul style="list-style-type: none"> • Preservation of socio-cultural authenticity • Increase the real sense of pride and identity to local communities • Educational development • Interchanges between hosts and guests cultural • Infrastructure development, such as roads, schools etc 	<ul style="list-style-type: none"> • Erode tradition values • Conflict with the local culture • Conflict with the historical heritage of the local community • Conflict with the religious heritage of the local community • Increased number of migrants to the area • Economic recession to low class and middle class peoples • Shop stock products for tourists and not everyday goods needed by the locals • The demand for holiday homes makes housing is too expensive for local people • Increases illegal activities like crime, prostitution, alcoholism, and drug addiction • Traffic congestion and road accident
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3.2. Socioeconomic Impacts:

The preliminary studies showed that overall income (≈ 68 %) of the local people was increased positively and especially the income of lower and middle class people was considerably decreased due to tourism. An important goal of tourism with respect to economics is to increase income rate of local residents and neighborhoods rather than outsiders. The present study revealed that only 30-40% of tourism lodges, restaurants, resorts and other tourist service facilities are providing jobs for the local people and buying products from the local farms. Remaining 60-70% of tourist service facilities running by local as well as outsiders were providing employment preference to non-local people and buying product from outside farms. Interviews with the local people was clearly indicated that only a small portion of tourism income was reaching the local people through the small shop keeping, stay home, local transports and selling of local products like honey, homemade wines, herbs, etc. Remaining tourism income was concreted in the non-local people who are holding the high class restaurants, lodges and resorts. Employment offers to lower level workers and lower class people during the tourism activity was much influenced on the local laborers for agriculture activities in the district. All the farmers were expressing their regrettable situation of laborers shortage to work on their farms and irrigation activities during the tourism seasons. The available laborers were distributed between the agriculture and tourism activities and higher labor cost were viewed as a potential effect on the middle

class farmers by tourism in the district. It indirectly affected on the agriculture based economic income to the middle class farmers in the district and most of all the farmers were converted their fertile agricultural land into the commercial purposes due to the lack of labors which is influenced by tourism. The study clearly indicated that prices of all basic necessary things like food, shelters, cloths, medication and other services in the district were gradually increased due to tourism and it was directly affecting on the economic as well as social conditions of lower class people like labors, small farmers, local workers and small shop keepers etc. Due to influence of tourism activities, real estate prices and demand of consumer goods were considerably increased which affected on the socio-economic levels of the local communities and middle class people in the district. Due to the shortage in the overall income of lower class people to fulfill their basic needs about 80-85% of lower class people and small shopkeepers who depending on tourism income to lead their daily life were expressed like tourism income were temporary and highly influenced by seasonality. It was observed that larger percentages of their income were spending for food (40-45%), house rent (30-35%) and remaining for transportation, recreation, savings, and other expenses. Socio-economic conditions of a particular region mainly depend on the local environmental health and potential natural resources of an area. Due to extreme tourism activities was considerably destructed the local environment in the district and it was indirectly

increased the health risks of the local people and effecting on their normal livelihood. Increased environmental pollutions like water, air and soil pollution along with increased disposal and deposition rate of solid waste by tourism leads to the health risks in the local people and further increase the treatment and medication cost of the people. Interestingly, some farmers who have their own land also received a small portion of income within their farms by small lodging services along with selling of food and herbal products to the tourists and they were expressing their gratitude on tourism.

The study showed that tourism based employments like shop keeping, stay home, small hotels and coffee bars and other activities were mainly held by youngsters (< 30 years) and among them local women were dominated (86 %). Also ≈96% of the local people well educated and has a good communication and business skills due to tourism influences. The local communities also social benefit from tourism such as improvement of the social infrastructure like roads, schools, libraries, health care institutions, internet cafes, and so on. The study also revealed that negative impacts of tourism on the local cultures such as local dignity, erosion of traditional culture, local culture changes, migration of the local community, intensify to imitating the behavior and culture of tourists visited often etc. It was also observed that increased crime, prostitution, alcoholism and drug addiction of the local communities especially in youth due to tourism. Besides, if the local culture is the base for attracting tourists to the district, it helps to preserve the local traditions and handicrafts. The study revealed that tourism activities promoted both positive and negative impacts on the local environment and socio-economic conditions of the local community and the list of major socio-economic impacts of tourism activities are tabulated in Table 2.

4. Conclusions:

The present study revealed that tremendous damage to the environmental wealth such as pollution, loss of biodiversity, deforestation, over consumption of resources, wildlife threaten and solid waste disposal, etc. by tourism in the Kodagu district. Due to defective tourism and disturbance of the local environment and habitat, the economic condition of the local communities is turning west. Tourism has made an overall impressive contribution

on the socio-economic conditions by increasing social infrastructures and the development progresses. Tourism also promoted illegal activities, crimes, labor problem, flowing of the major tourism income to migrants in the district. Based on the results obtained it could be recommended as profitable tourism in the district, without destructing the local environmental health and local traditional culture by implementing sustainable ecotourism concepts, cooperation, participations of local community and strict laws.

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