Tourism Impact Assessment in Forested Land Using Geo Informatics

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Abstract: *The environment is being increasingly recognized as a key factor in tourism. The main purpose of tourism activities is the deployment of recreational facilities in an area with tourism potential. Tourism in Athirappilly is the largest industry, that providing several benefits to government and rural peoples. Tourism emergence, which lead naturally or consciously to the degradation of tourist heritage are represented by the natural disturbance of the surface areas of tourist interest and forest cover. The study focused on the impacts of tourism on forest area in Athirappilly region by comparing Landsat images from 1985 and 2012.The work was mapping the affected areas of forest as a result of tourism introduction based on physical characteristics. These are landscape or naturalness (land use/cover), topography (slope, drainage) and settlement size. At First, a list of tourism related criteria were developed. In present study raster based weightage method was carried out for the preparation of tourism disturbance map. GIS based techniques were used to measure the ranking of different criteria according those with the best potential for the study data utilized include survey of India to geographic maps. Subsequently, the forest disturbance map was created based on the combination of criteria and factors with their respective weights. The disturbed area of forest was classified as very high, high, moderate and low. The methodology proposed was useful in identifying disturbed areas of forest by linking the criteria deemed. GIS can then subsequently evaluate dynamic patterns of land use cover as well as, providing a tool for ecotourism planning in Athirappilly areas. Likewise, this study can be used as a basis for identifying mitigation measures for more complex studies in future.*

Keywords: GIS, Tourism, Forest disturbance, Athirappilly, Raster

1. Introduction

Tourism is one of the fastest growing industries globally, and within tourism, the nature-based tourism is considered to be growing most rapidly Even if a region has rich ecological and cultural wealth that might have tourism potential, tourism develops in a way that it directed purposefully, i.e., tourism geography is a construct by the agencies, and natural as well as cultural landscape is only fine-tuned for it in the process. (Jussi Ramet etal, 2010). Sangeetha, (2014) have discussed that Tourism in India has seen exponential growth in the recent years. India is one of the most preferred destinations for both overseas and domestic travelers. Tourism enables the international traveler to understand and experience India's cultural diversity first hand. According to official estimates the Indian tourism industry has outperformed the global tourism industry in terms of growth in the volume of foreign tourists as well as in terms of revenue. The main reason for the growth in tourism in India is the tremendous progress made by the Indian economy. Kerala, a state situated on the tropical Malabar Coast of south western India, is one of the most popular tourist destinations in the country. Named as one of the ten paradises of the world by the national geographic channel, kerala is famous especially for its ecotourism initiatives its unique culture and traditions, coupled with its varied demography, has made kerala one of the most popular tourist destinations in the world. Tourism industry is a major contributor to the state's economy (Vinay Raj R, 2012).

Tourism and the environment have a very complex and interdependent relationship. Tourism one of the largest industries in today's world economy and is a largest source of foreign exchange for many developing location whose major use are their natural resources (Sindio,1984). The environment is being increasingly recognized as a key factor in tourism. During the last decade of the twentieth century, this idea has strongly emerged that tourism depends ultimately upon the environment, as it is a major tourism attraction itself, or is the context in which tourism activity takes place (Holden, 2000)**.** Josphat Belsoy (2012) have pointed out positive effects of tourism activities in protected areas. The positive effects include the creation of employment, the increase in the economic levels, promotion of conservation of natural spaces, minimizes the migration of the local population, and improvement in the economic and socio-cultural level of the local population, the commercialization of the local products, exchange of ideas, costumes. Negative effects include the rising of consumption of ground (space), water, energy, destruction of landscapes with the creations of new infrastructures, the rise in the production of disposals (wastes), the alteration of ecosystems, the introduction of exotic species of animals and plants, the loss of traditional habits (hard work to idleness), the increase in prostitution (sex tourism), the narcotic traffic, more forest fires and the increase in the prices of goods and services (e.g. houses, labour around tourist destination). Tourism affects the environment of a protected area in any destination either directly, indirectly or cumulatively which could determine the sustainability of tourism and its related activity in the protected area. (Josphat Belsoy, 2012).

Natural resource managers and environmental modelers thus require reliable information about the ecological impacts associated with natural and anthropogenic disturbances to forests (Bricker and Ruggiero, 1998). GIS science community has begun to explore new ways to detect, characterize, and monitor forest change through the integration of remote sensing and GIS (geographical information system) data and technologies (Kasischke et al,2004). The integration of remotely sensed and GIS data takes four forms: (a) GISs can be used to store multiple data

types; (b) GIS analysis and processing methods can be used for raster data manipulation and analysis (e.g., buffer/distance operations); (c) remotely sensed data can be manipulated to derive GIS data; and (d) Impacts on forests. GIS data can be used to guide image analysis to extract more complete and accurate information from spectral data.

2. Materials and Methods

The study focuses on forest disturbance analysis of tourism in Athirappilly using GIS. Data gathering included field surveys, and secondary data collection from various organization and individuals. A collected material include annual reports along statistical data at Panchayath level and other documents related to tourism projects and research. Firstly primary data from field survey were collected through receiver was used in the field survey for location mapping. National institutions are also contacted for the collection of necessary information and literatures. Secondary data were gathered from department of survey of India. As mentioned above, the primary data collection was accomplished by using a survey which is one of the important social research methodologies. Direct and indirect interviews were also done formal and informal interviews were also conducted during the field survey to gather more information. The secondary data also includes existing research literature and document survey. The thematic maps were prepared and edited/over laid and visualized on the basis of weighted method for forest disturbance using arc GIS 9.3 software of ESRI.

In present study tourism disturbance mapping has carried by using raster based weightage method by using arc GIS software. For this study collecting the topographic map from survey of India (SOI). Of topographical map at scale 1:50,000 were geo referenced and boundaries are digitized. After geo referencing the toposheet, open Arc Catalog, again open Arc map and add the toposheets that geo referenced early to create forest disturbance map objective five parameter such as land use, drainage, road, slope, and road buffer are to be selected. For each parameter a category map has been created using GIS which shows variability of that parameter in the region. Disturbance has been divided into several categories. In the end a weight has been assigned to each categories and finally five maps have been overlaid and a forest disturbance map has been developed. Collectively five parameters of slope, road, Drainage density, and land use and road buffer were used to construct spatial database. Identify each of the categories of the land uses and vectorize them and add attribute name to them.

3. Result and Discussion

The most striking fact is that the tourism destinations and the areas which are closely related to it have been severely showed the negative impacts of tourism and it proved to be a deep concern and a matter to be discussed. As per the classification, such regions comes under the "very high" category and under "very high" category and prone to the dark phase of tourism. The regions comes under "very high" category are vazhachal, peringalkuthu, Athirappilly, Thumboormuzhi, Were there is high reduction and degradation in the forest cover. The region which are

classified into "high" as per the criteria Kannamkuzhi, Malakkapara, Sorapara, Valiyavara, kullanchira, and they are located far away from the tourism destinations. Pandimudi, Idupuratodu, Anapaian, Mangattukudumban, Anaikal comes under moderate category. In this study area, 45% of it lies within the tourism spots. In it high category forest plantations are observed. They are emerged by replacing the moist deciduous forest cover. There were five criteria in the form of GIS- based layers incorporated for tourism disturbance evaluation. Tourism in Athirappilly take place in natural area which have endemic characteristics including cultural and natural forest resources that are closely connected to that area. The perfect terrain in the word, where the "beauty meets quality" and this beauty and quality for a forest defined as the most undisturbed one. The quality and sustainability will ensure that the forest ecosystem is healthy, having an adequate representation of biodiversity and natural process. Sustainability of the Athirappilly –sholayar forest is a growing concern among forest areas interested in the ecological social and economic benefits of their ecosystem. The endemic fauna and flora are in the verge of cultural extinction because of depletion of suitable habitat due to dams, plantations, and tourism.

Tourism has the potential to create beneficial effects on the environment by contributing to environmental protection and conservation. It is a way to raise awareness at environmental values and it can act as a tool to finance protection of natural areas and increase their economic importance. Tourism can also degrade environment. Habitat fragmentation and species loss occur in southern part of Western Ghats as a result of extensive anthropogenic activities. The forest fragmentation and increasing fire frequencies in Western Ghats are due to intensive human pressure. A strong increase in tourism also enhances the risk of introducing alien plant species in particular in the Athirappilly sholayar torrent zone. The survival of native plants is threatened by non-nature or exotic plants as they commonly have improved abolition to compete for water light, nutrients and space.

Land use cover\Land cover
The most common vegetation cover of the study region is evergreen/semi evergreen forest. Vegetation cover is one of the most significant factor of natural based tourism. There for evergreen/ semi evergreen forests are ranked with high value. These are located large away from the tourism spot. Therefore, these area carries small amount of disturbances. The result show that the major human included disturbances on land use/cover was employed as forest plantations, cropland formation, and dam construction 4535.42 ha, area is under take plantations of total area of forest, softwood plantations 670.12 ha, pulpwood plantation 101.04 ha.

Roads
Needless to say, roads are the main channels of a country and most of the trips made on roads. What makes this issues important for Athirappilly tourism area and the region under study infect that roads pass through forests. A tourist view point, this is an ideal opportunity, but form an environmental view point, this counts as a potential treats to the forest as it may cause habitat destruction of wildlife, damages on plant species and raising a potential threat to the forest as it may

cause fire. The negative impact of tourism on study can be analyzed in different ways. One of them cooks at the specific elements of the ecotourism of the tourist locate. It has been found that human and vehicular traffics affects both the soil and the vulnerability of plants. It has also have an effect on air. Air pollution can be attributed to the congestion of tourist vehicles in hotel areas. Waste disposal is another problem is faced by the area of travel by the tourist

Drainage

Drainage is the natural or artificial removal of surface and subsurface water from an area. Drainage can be either natural or artificial. The study area have some natural drainage; this means excess water flow to lakes and rivers. The running water is an important natural agent required for development of healthier forest. Western Ghats the landscaping regions are mainly carried out by rivers and channels. Anthropogenic disturbances of fresh water resources as a consequences of tourism are very diverse.

Slope

One of the main reason for considering slope as a parameter is that where in regions where slope is seemed to be seen more it is seen that human intervention seems to be less: so where in areas where slope seems to be increased, forest disturbance due to tourism is decreased to great extended.
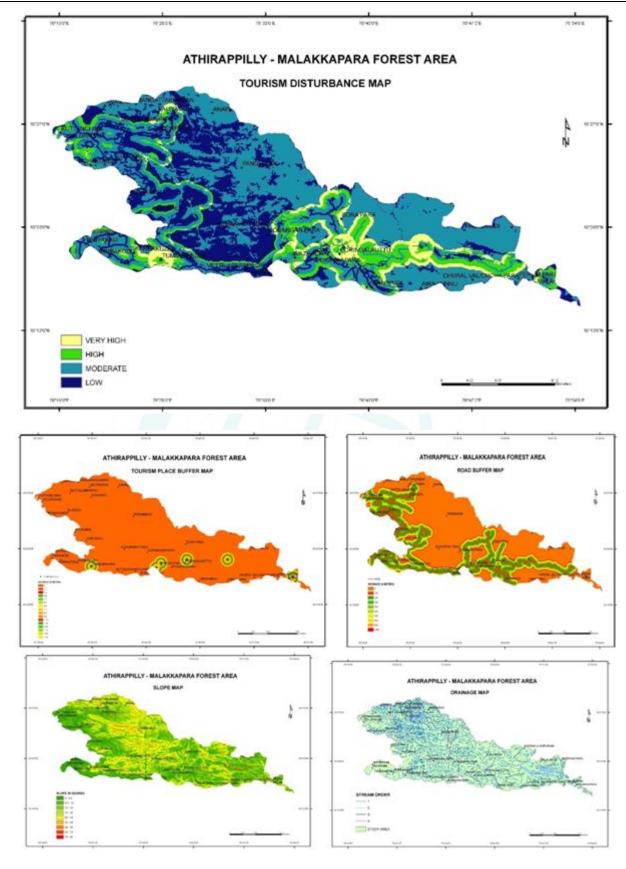
4. Conclusion

Tourism in Athirappilly dependent on and a user of natural resources and is recommended that tourism be specifically addressed by regional policies that deals with natural resources and considerations. Facilities and infrastructure development in provenance should be in harmony with the local authority and with nature. Preparations of guide lines or frame works for workshops to specifically address issues related to resource management, indigenous people conservation, and ecotourism market planning. It is very important more people especially in Athirappilly visitors, are educated on the concept of sustainable development and the principle for sustainable living therefore, the issues of forest management and conservation of biodiversity should be addressed with the local communities and stake holders in protecting ecosystem and biodiversity. Adaptation of ecotourism influences far reaching impact toward extending principles of sustainability into other forms of tourism. The main element of strategy to protect effectively biodiversity and the ecological value of forest as well as to manage conflicts between forest protection and benefits of tourism. The use of GIS is not only ideal for reducing The time and

cost of, but also provide digital data bank for long-term and beneficial monitoring of disturbances .With the respect to the techniques in this study, the integration of GPS and GIS techniques has been proven beneficial for supporting decision making. The uncontrolled tourism in its unscientific way itself kills the industry. Forest disturbance mapping may not provide the ultimate explanation for all problems and cannot be an end in its self rather. It serves as a base to understand are of forest removed as the result of tourism introduction. A badly organized tourism development strategy will have some adverse effects on the country rather than the development of the country. While forming and implementing ecotourism measures, the three main aspects to be emphasized that is prevention of pollution, carrying capacity based tourism and tourist environmental policy.

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