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AN APPRAISAL OF LANDUSE AND LAND COVER AND PERCEPTIONS OF THE BEACH COMMUNITY: COLVA - GOA, INDIA

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Abstract

Tourism is one of the fastest growing industries that have phenomenally brought a socio-economic-environmental transformation at the tourist destinations. This calls upon understanding societal drivers and coastal ecosystems to appraise change and sustainability. Goa is one of the popular destinations, visited by lakhs of domestic and international tourists. This tropical paradise experiences beach tourism as most popular, as more than 95 per cent tourist arrivals visit beaches. Further, with increasing tourist numbers, the demand for tourism related infrastructure and pressure on land has increased. This has brought significant transformation in landscape and land use /land cover in coastal Goa. Taking the case of Colva, Salcete – a coastal tourist destination of South Goa, the following paper has been attempted to study change in Landuse and Landcover. Further, survey was conducted to gauge the perception of the local residents in context of growing tourism at the destination. Both negative and positive perceptions are highlighted in the study.

The integration of remote sensing data with GIS technology for geographical studies is vital because each has strength in certain aspects related to these attributes. Accordingly, satellite images of tourism destination were obtained, Geo-referenced, digitized and layered by using Arc GIS Software to estimate the land use and land cover. Further, to understand the perception of the local populace in response to tourism, household survey was conducted of 50 respondents that reside within one kilometer buffer zone from the beach. Further, descriptive statistics was used to analyse the same

The Study reveals that there has been significant change in the land use/land cover over the decades, where in there is proportionate decrease in agricultural lands and marked increase in built up area.

***Key words**: Landuse, Landcover, tourism, GIS technology.*

Introduction

Tourism is the world's largest globalized industry and is also the fastest growing economic sector. As globalised phenomena, it has a unique and phenomenal ability to bring

about environmental and socio-economic transformation at the tourist destination. In the context, the importance of the coastal area as a study object has emerged in recent times. Coastal areas give scope for distinctive activities. The sun, sand and sea eventually give the distinctiveness in coastal tourism. This tourism is environmentally dependent (Zhang Jingnan 2001) the natural beauty and environmental quality of these coastal areas makes them very attractive to tourists. Their complexity is significant in terms of population dynamics, change in patterns of land use as well as socio-economic change. These influences can be observed in both large and small tourist destinations (Mc leod, 2006).

The present research attempts to apply GIS to analyze various attributes at Colva; a beach tourist destination in South Goa district. Various GIS tools have been used to detect the land use & land cover change, tourist resources and predict environmental disaster. For example, in this context, Remote Sensing Data derived from various satellites can give insights of areal extent, conditions and boundary of the mangroves, changes of areal extent of the landuse / landcover.

Objective of the Study

- To assess the change in land use and land cover over a period of time and perceptions of the locals towards tourism.

Data Base & Methodology

The following study is result of both primary as well as secondary data. Satellite images of the study area were obtained and digitally processed to ascertain the change in the land use/landcover due to tourism. For this, Google earth was the source of satellite images and the corresponding latitudinal and longitudinal details. Snapshots of the beach and surrounding area of Colva were taken of two years 2004 and 2014 at a suitable zoom level and geo-referenced in the geographic data processing software, 'ArcGIS.10'. The geo-referenced images were transferred to the software 'Erdas 9.3' where mosaicing was carried out. The mosaiced images were then digitized in Arc GIS in specified layers to estimate the land use and land cover change.

Further, to understand the perception of the local populace in response to tourism, household survey was conducted of 50 respondents that reside within the one kilometer buffer zone from the beach. Further, descriptive statistics was used to analyse the same. For the purpose of the study, 15 positive and 13 negative indicators have been taken. It is the outcome of perceptions, recent events reported in the newspaper, television related to Goa's tourism and review of various national and international journals. These indicators are strictly based on local perceptions. In order to assess the locals' perceptions on various socio-economic factors, a questionnaire was prepared based on the 5 point Likert scale, ranging from strongly agree (5) to strongly disagree(1). Care was taken to ensure that the respondents were residents of the region for more than 15 years at least. The range of age of applicants was from youth fresh out of college to retired senior citizens.

The questions were based on various factors that could affect them in the course of development of tourism, such as interaction with the tourists, influence of tourists on their culture, fallouts of tourism such as garbage disposal management, crime and drug increase,

capture of land by hotels. Also, factors which could benefit them such as better infrastructure for locals, increased transport network, higher standard of living, creation of jobs, etc... were considered while interviewing the locals.

Discussion

Land is considered as space, territory, location, ecosystem, resource and above all, a human habitat. Natural resources are responsible for human interaction and this together with terrain features determine the selection of proper land use pattern which also in some ways reflects the cultural, social and economic conditions. Land use is referred to as man's activities and the various uses which are carried out on land. Land cover is referred to as natural vegetation, water bodies, rock and soil, artificial cover and others resulting due to land transformation. Since both land use and land cover are closely related and are not mutually exclusive, they are exchangeable as the former is inferred based on the land cover and on the contextual evidences. The term land use and land cover are often used concurrently to describe maps that provide information about types of features found on the earth's surface and the human activities associated with them. The land use and land cover is an important parameter for development, planning and management of resources in the territory. It helps us to know the exciting land use /land cover but also the capability to monitor the dynamics of land use results out of changing demand. Coastal land use patterns differ slightly from other land use patterns in terms of more area utilization for entertainment, lodging and eating establishments as compared to agriculture or fixed settlement zones.

For the following study of land use/ land cover of Colva, being a developed tourist destination, it is assumed that it should have had a more defined pattern of land use and land cover. For a land use and land cover mapping - the image of 2004 is compared with the image of 2014 and the area in sq.km is calculated and based on the difference, the land change is calculated (table. 1).

Table 1— Land cover of Colva beach area (area in sq.km)

Sr.no	Land cover class	Satellite image (2004)Sq Km	Satellite image (2014)Sq Km	Change in area (sq.km)	Per cent Change
1	Vegetation	0.50 (5.25%)	0.36 (3.78%)	-0.14	-28.00%
2	Agriculture	0.48 (5.04%)	0.33 (3.47%)	-0.15	-31.15%
3	Built Up	7.78 (81.80%)	8.35 (87.80%)	+1.27	+7.33%
4	Plantation	0.52 (5.46%)	0.39 (4.10%)	-0.13	-24.90%
7	Beach	0.23 (2.41%)	0.08 (0.84%)	-0.15	-65.14%
	Total	9.51	9.51		

Further area under each land cover class has been measured according to scale. Accordingly the area covered by each land cover class has been analyzed accordingly.

From the table 1, it is evident that the vegetation cover was occupying 0.50sq.km in 2004 and by 2014 it has come down to 0.36 sq.km. That means 0.14 sq.km of area under

natural vegetation is lost. This is due to the utilization of land under green cover for establishments for tourism related services. Being a coastal area, there is high preferences for hotels, resorts , restaurants etc. Further, it is also observed that there is a decrease in the agricultural land. In 2004, the area under agriculture was 0.48 sq.km and subsequently it decreased to 0.33sq.km. It can be attributed to increase in construction and settlements. A cursory glance at the Colva beach destination will showcase mushrooming of significant number of hotels. Further, it is universally seen all over Goa that the local populace is giving up agriculture and the land is either sold or left barren before it is sold to property builder. The growing demand for land has escalated the property prices.

Transport is the key factor for developing tourism. It is evident from the digital image and table 1, that the length of roads has increased from 7.48 km in 2004 to 8.85km in 2014. New metalled roads have been constructed to make an easy pathway for the tourist to come in and out of Colva.

Landuse / Land cover Map : Colva 2004

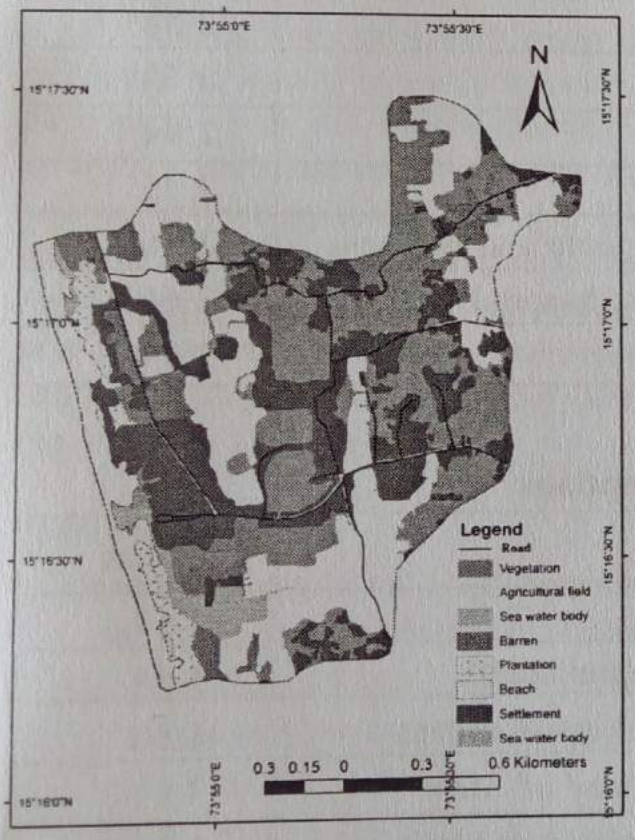

Fig.1

Landuse / Land cover Map : Colva 2014

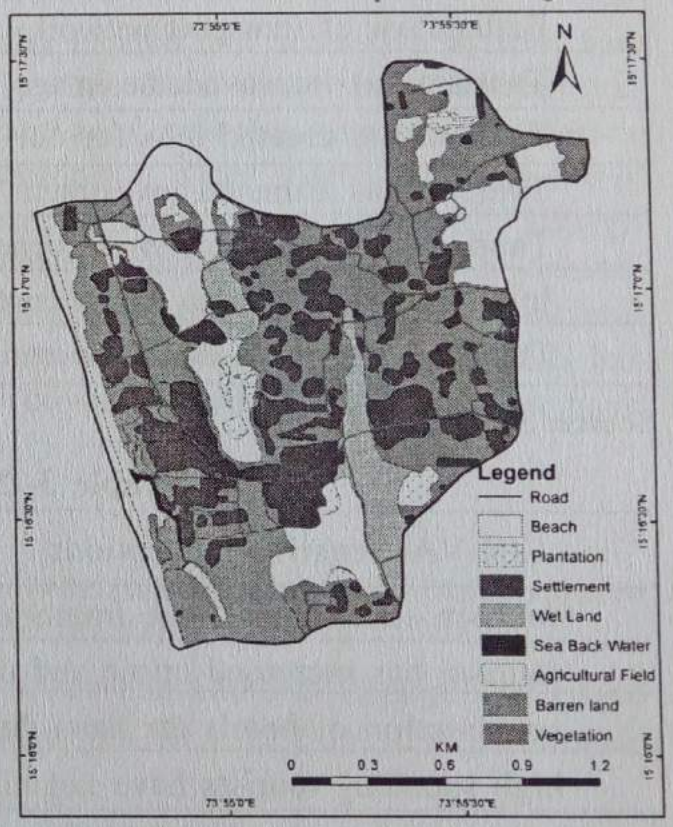

Fig. 2.

From the above digital image, it is seen that there has been an increase in the built up area. More hotels and resorts have come up because of the amount of tourist coming in Goa has increased. Since Colva is the most popular tourist destination in south Goa, it slowly shows overcrowding of hotels and resorts.

It is also noticed that the beach area has reduced by almost 65 per cent. (from 0.23sq.km to 0.08sq.km). This is basically indicative of encroachment in the beach area available. This would be by temporary structures like the shacks or some illegal constructions.

Perception :

The perceptions of locals regarding the effect of tourism play an important role in determining the impact of tourism on the village of Colva. The positive indicators are, employment, investment, economic benefits to the locals, understanding the other cultures, infrastructural improvement, level of awareness and encouragement of various cultural activities of Goa. The negative indicators are construction of hotels destroy the natural environment, high spending tourist affect the way of life. Living in the tourism destination the locals suffer due to traffic congestion, noise pollution, unpleasant overcrowded beaches, change of traditional culture, working in tourism industry brings insecurity and restriction on traditional culture.

Table 2: Positive perceptions

COLVA-Positive perceptions score	Mean
Standard of living is relatively higher	3.02
Land prices have increased	4.58
Better flow of transport network	2.58
Tourism has improved the image of Goa	3.63
Tourism has created jobs for our community	2.94
Tourism has attracted investment to community	2.75
Tourism has given economic benefits to local people and business	3.16
Infrastructure at Colva has been enhanced-roads, hospitals...	2.66
Ttandards of living increased considerably	2.97

Source: Survey, 2012

Table 3- Negative perceptions

COLVA-Negative Perceptions	Mean
tourism encourages some immoral behavior	3.41
tourism has increased crime and drugs in local community	3.44
construction of hotels etc have destroyed natural environment	4.30
high spending tourists have negatively affected way of life	3.11
locals residents have suffered from living in tourist destinations	3.13
tourism has resulted in traffic noise n pollution	3.08
Tourism has resulted in unpleasantly overcrowded beaches.etc...	3.20
tourism has changed our traditional culture	2.69
There is increasing garbage.	3.5
demonstration/ conflicts between tourists and locals	3
village environment changed due to tourism	3.43

Source: Survey, 2012

The foremost positive perceptions have been increase in the land price (for local it's positive as they are able to get a better deal) economic benefits to the locals and also given identity to Goa as a tourist destination where as people feel there has much to be done in the area of infrastructure and facilities. Colva is one of the favourite tourist beach destinations in the south Goa district and therefore, the fact that there has been concentration of tourist services that has been value addition in terms of land and built up property. Further, as tourism is a service industry, there is immense scope for the employment in the hotels, restaurants, transport, water sports, etc. This has definitely benefitted the locals economically.

The negative impacts have been that constructions of hotels and subsequent destruction of the natural environment. This is obviously been observed from the land use and land cover study. Subsequently, it is also observed that Colva is one of the overcrowded beaches of Goa and this leads to other adverse effects. Colva being visited by international and domestic tourists, at times there have been incidents of immoral behavior too. The local community also feels the same.

Conclusions

Colva is a developed beach destination, ideally located and accessible by road and railway. The airport is on 25 kms away. Subsequently, there have been tourist facilities that have come up in and around Colva. For example - there are hotels that range budget tourists as well as high end tourists. Lately there has been addition of water sports. This makes this beach a tourist attraction and also overcrowded, inaccessible and ideally located. . Though there is economic multiple gains, the social and environmental impacts cannot be denied. Reduction of green cover, increasing traffic and garbage and also increase in anti societal acts is a threat to the tourist destination. The application of remote sensing and GIS has enabled to assess the changing land use and land cover and also the sectors that have experienced this dynamism.

References:

1. Honey Martha (2007), Global trends in Coastal tourism, Centre for Eco tourism and Sustainable Development, University of Stanford, USA.
2. Macleod Donald V.L., (2006), Tourism, Globalisation and Cultural Change: An Island Community Perspective, Published by Vinod Vasishtha for Viva Books Private Limited , New Delhi 110002,
3. Nairy K, Kazi S. Abraham M. and Jorge R. (2003), The Baga Nerul watersheds: Tourism, local stakes and transformation, article published in the coastal tourism, environment, sustainable, local development TERI, New Delhi
4. Prabhakaran et.al (2010), Remote sensing and GIS application on change Detection study in coastal zone using Multi-temporal satellite Data, International Journal of Geomatic and geosciences 1(2) Pp 15g-166.
5. Raikar Avinash V (2010), "Growth, Problems and Prospects of Tourism in Goa", Article in Mazumdar D and Mishra L(Ed), Contemporary Tourism Development Issues and Challenges, Rajat Publications , New Delhi 110002 (India), Pp10-15.

6. Zhang Jingnan (2001), Analysis of coastal tourism with the aid of remote sensing, paper presented at the 22nd Asian conference in Remote sensing, 5-9 Nov,2001 Singapore.

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Declaration

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