

ECOLOGICAL SENSITIVITY AND PRESENT LAND USE OF WAYANAD DISTRICT, KERALA

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Abstract

The term 'Ecological Sensitivity' is an Indian invention, which means 'areas that are ecologically and economically very important, but vulnerable to even mild disturbances and hence demand conservation'. The Ministry of Environment and Forest set up two committees namely Western Ghat Ecology Expert Panel (WGEEP) popularly known as Gadgil Committee in 2011 and High Level Working Group (HLWG) known in public sphere as Kasthurirangan Committee in 2013 to identify the Ecologically Sensitive Areas of Western Ghat and to make suggestion to conservation of forest in the region. The WGEEP report included entire Wayanad district within ESA and all villages are demarcated as 'no go areas' whereas according to HLWG report the total area of ESA in the Wayanad district is 952 sq km, which constitute 44.5 percentage of total geographical area of the district and 13 villages are ESA's. As per the recommendations of these two reports the economic activities should be restricted. In this context environmental protection versus agricultural, commercial and residential land use comes into action. The district has remarkable variation in land use pattern, which is dominated by plantation with a growing urban centre surrounded by forested area. This paper analyzes the present land use of the district using geospatial technology.

Key words: Western Ghat, Ecologically Sensitive Area, Land use.

Introduction

The Ministry of Environment and Forest (MoEF) has appointed Madhav Gadgil as the Chairman of Western Ghat Ecology Expert Panel (WGEEP) to identify Ecologically Sensitive Areas (ESA) of Western Ghats and to suggest various methods to conserve, protect and rejuvenate the biodiversity of the region. ESA is 'no go areas' or 'inviolable areas' and which delineated by using the parameters designated by Proneb Sen Committee in 2000. A Supreme Court judgment on a writ petition (no 460 of 2004) filed by Goa Foundation against mining provided the background of Gadgil committee (Nisha and John, 2017). The panel defined Ecological Sensitive Area as "those areas that are ecologically and economically very important, but, vulnerable to even mild disturbances and hence demand conservation" and the report was submitted on August 30, 2011. A strong protest against the report was erupted in Kerala due to sheer negligence attitude towards local people. Hence, another committee was appointed under the Chairmanship of Dr. G Kasthurirangan as High Level Working Group (HLWG) to study about Gadgil report and examine its implementations. But the Working Group submitted their new and a separate report on April 15, 2013. Again a wide protest had occurred against these two reports due to unfair imposition of strict regulations. The Gadgil Committee emerged due to the projected global environmental crisis due to continuous degradation of forest and resulted problems on land, water and air but the second committee were set up to study the implementation of Gadgil Committee report. Thus the backgrounds of two expert committee reports are different.

There are great differences in methodology, parameters and recommendation of these two reports. In the case of Wayanad district of Kerala, WGEEP included entire village within ESA, incredibly Kalpetta Municipality the only urban centre in the district with population of 31,580 and a density of 775 persons per square kilometer is also being enlisted as an ESA,

but HLWG limited ESA to 13 villages of the district. These two reports does not give any description about the affected population and present land use/ land cover and also not analyzed impact of their recommendations on occupation and livelihood with the delineation of ESA. A critical absence of demographic analysis is the drawback of the expert committee reports and which was the main reason for the unrest. In both report some activities like mono cultural plantation, industries and mining etc. should be banned within ESA and both the reports are silent on impact of such restriction on life of local people and their rehabilitation.

The parameters taken to demarcate the ESA by Working Group are density of population (below 100 persons/sq km) and percentage of forest area (villages with 60 % under forest area) at village level. On this background an enquiry into the demographic aspects and present Land Use/ Land Cover of ESA's would be handy in understanding the problems in detail. For the purpose of the study the demarcated 13 ESA villages are taken into account as being suggested in the HLWG report.

Significance of Western Ghat

Western Ghat located as a barrier in eastern coast of Indian Peninsula from North to South direction in an East to West rotating Earth. Its latitude extends from 8° 0' N to 22° 26' N and longitudes from 72° 55' E to 78° 11' E in the tropical monsoon climatic region for 1600 km from Kanyakumari (Tamil Nadu) to Tapi river (Gujarat). Tamil Nadu, Karnataka, Goa, Maharashtra and Gujarat with approximately 30 to 50 km push excepting Palghat region, (Nisha and John, 2017). The perpendicular site with respect to latitudes and maximum altitude 2900 m (Anamudi hills) trap the moist laden on shore Arabian Sea branch of South West monsoon and receiving heavy Orographic rainfall in western slope and eastern slope is comparatively dry as it is a rain shadow. It is largely a mountain area that receives annual rainfall between 2,000 and 8,000 mm of within a short span of three to four months. The Western Ghats performs as an important hydrological and watershed function (Arundhati Das, 2006). This is 'water tower' or a source region of peninsular rivers. The Laterite soil formation in the hill slopes of Ghats is the result of leaching process due to high torrential seasonal rainfall and temperature. The moderate temperature with coastal influence and heavy seasonal rainfall causes the luxuriant growth of evergreen and semi evergreen vegetation and it is the home for large varieties of fauna. There are high level of topographic and climatic heterogeneity in the Western Ghats, which support diverse vegetation and distinct fauna (Nihara, 2007).

It is estimated that there are four thousand species of known flowering plants in the Western Ghats and 1,500 (nearly 38 %) of these are endemic (Nair and Daniel, 1986). The Western Ghats supports a diverse fauna, among the vertebrates, birds represent the largest number of known species (508 species), followed by fishes (218), reptiles (157), mammals (137), and amphibians (126). Many of these species are endemic to the Western Ghats region. The greatest number of endemics is found among the amphibians (78 %) followed by reptiles (62 %), fish (53 %), mammals (12 %), and birds (4 %). (Arundhati Das, 2006)

Study Area

There are several reasons for selecting the Wayanad district as the area for the present study. Geographically, Kerala is divided into three physiographic divisions such as Highland (Malanadu), Midland (Edanadu) and Lowland (Coastal Region). In Kerala, Western Ghat stretches in ten district of the State but only Wayanad district lies entirely in High Land region and it is shows a similar topography of Karnataka plateau. Mono crop plantation

oriented agriculture economy of the district has a significant role in the occupation and livelihood of the people. Western Ghat is the Hotspot Bio-diversity with high population density and Wayanad is the least populated district among the other district of the state. Finally, it is a hub of tribal population in the state who are more concerned in forest conservation with adapted livelihood to the nature.

Wayanad district extends from 11° 58' 40"N to 11° 58' 40" N latitudes and 75° 47' 23"E to 76° 26' 40" E longitudes. It was formed in November 1, 1980. The total geographical area is 2138 sq km. The district is bounded by Mysore plateau in the northeast and contiguous with Nilgiris of Tamil Nadu, Kozhikode and Kannur in the north and north west and Malappuram in the south. The district has three taluks, namely Sulthan Bathery, Mananthavadi and Vythiri.

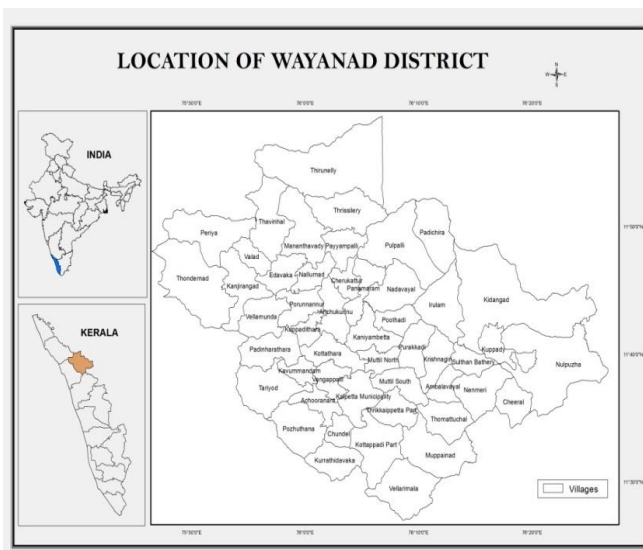


Figure 1. Location Map.

The district lies at an elevation of 700 m to 2100 m above mean sea level, hence totally in highland and 40 % of total geographical area is covered with forest. A major portion of the district is covered by coffee plantation. Lateritic soil covers major part and loamy soil is found in valleys which occupies in the middle portion of the district. The climatic condition is salubrious. The mean average rainfall is 2322 cm. Kabani river and its tributaries constitute the major drainage of Wayanad.

Objectives

To examine the basic criteria adopted by expert committees of MoEF with ground realities. To understand the population dynamics of ESA villages of Wayanad district. To analyze the present Land Use/Land Cover of ESA villages of Wayanad district.

Materials and Methods

The study utilizes Census of India data, for the period of 1981-2011 (District was formed in first November 1980) to understand the population status in ESA villages. Land Use/ Land Cover data were gathered and compiled from Kerala State Land Use Board (KSLUB) and

Kerala State Remote Sensing and Environmental Centre (KSREC). A detailed field survey were carried out to collect the details from EZA villages. The relevant spatial and demographic indicators are being mapped by using GIS software i.e. ARCGIS.10.1

Delineation of ESA

Gadgil committee adopted the criteria given by the Proneb Sen committee (2000) to demarcate entire Western Ghat into three categories ESA 1, 2 and 3 in a descending level of sensitivity like ESA 1 – strictly restricted areas, ESA 2 – moderate restricted area, ESA- low restricted area. The committee put entire Ghats into ESZ and National Parks and Wild life Sanctuaries considered as Protected Areas (PA) and 142 Talukas are classified (13, 70, 000 sq km) into ESA 1,2 and 3. Kasthurirangan committee classified in to Natural Landscape including protected area of forest and the areas to be protected and Cultural Landscape as human inhabited areas. The committee delimited with 37 % (60,000 sq km) of Western Ghat into ESA. The villages have more than sixty percentage of forest area with less population density were considered as sensitive area.

Mandates of Expert committees

Western Ghat Ecology Expert Panel	High Level Working Group
Conserve Thoughtfully Develop Sustainably Adaptive Co-Management Cumulative Impact Assessment Western Ghat Expert Authority	Cultural Landscape Natural Landscape

Discussion and Results

ESA and Wayanad district of Kerala

The WGEEP report included entire Wayanad district within ESA and all villages are demarcated as 'no go areas' whereas according to HLWG report the total area of ESA in the Wayanad district is 952 sq km which constitute 44.5 percentage of total geographical area of the district and 13 villages are ESA's. (Fig.1 and Table 1)

Fig. 2: Comparison map of ESA in Wayanad district of Kerala

Source: HLWG and WGEEP Reports

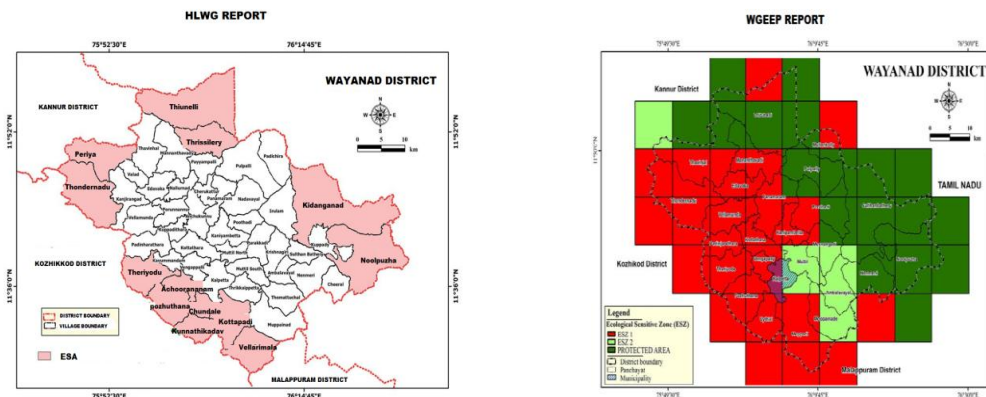


Table.1: Wayanad district : Geographical area occupied by ESA

Taluk	Area in sq km	ESA	% of ESA	No. of ESA villages
Mananthavady	749	364	48.5	4
Sulthanbathery	770	301	39	2
Vythiri	619	287	46.3	7
Total	2138	952	44.5	13

Source: HLWG Report

Demography of Wayanad district

The population of district was 553348 in 1981, 672128 in 1991, 780619 in 2001 and 817420 as per 2011 census. Decadal population growth rate was 21.47% during 1981-1991, 16.14% in 1991-2001 and 4.71 % in 2001- 2011 respectively. The villages of Kaniambetta, Nenmeni, Kuppadi, Padichira, Pulpalli, Manathavady have a population of more than 25,000. The distribution of population and its density decreases from centre to peripheral area and the developments of basic amenities is limited towards the edge of the district.

Working Group considers density of population as the vital determinant of demographic aspect of the ESA region and preset a limit of 100 persons / sq. km. Based on the geographic factors there are spatial variation in distribution and density of population from one region to another. The average density of population is 384 persons per sq km. It is also noted that, a few villages have the density below 100 persons / sq. km like Thirunelli, Kidanganad and Theriyod. Kalpetta municipality is the densely populated area with 775 persons per sq km which is two times higher than the density of the district, but it is under ESA 1 and ESA 2 where the anthropic activities having strict restriction as per Expert panel report.

Total populations of ESA villages are 145171 with a density of 152 persons per sq km. Here anomaly in HLWG report is clearly visible, report in the context of Western Ghats suggested that, one crucial parameter decides whether an area will fall in ESA was that of density less than 100 persons per sq. km. But in Wayanad case most of the ESA village does not fit in this criteria. (Table 2)

Table. 2: Wayanad district: ESA villages, Area, Forest Area, Population and Density in 2011.

Sl No.	Block	ESA Villages	Area (sq.km)	Forest Area (in %)	Population	Density of population
1	Mananthavadi	1. Thirunelli	150	81.16	12878	85.85
		2. Thrissilleri	54	81.5	16818	311.4
		3. Periya	63	82.76	11174	177.36
		4. Thondarnadu	97	88.55	11752	121
2	Sulthan Bathery	1. Kidangad	176	33	9122	51.8
		2. Noolpuzha	123	78	14133	114.9
3	Vythiri	1. Theriyod	54	34.24	1653	30.6
		2. Achooranam	21	2	11998	571.3
		3. Pozhuthana	50	10.06	6406	128.12
		4. Kottappady	55	11	10309	322.15
		5. Chundel	16	10	7996	499.75
		6. Kunnathidavaka	32	12.36	23384	425.16
		7. Vellarimala	58	10.86	7548	130.1
		Total	949		145171	152.97

Source: Census report

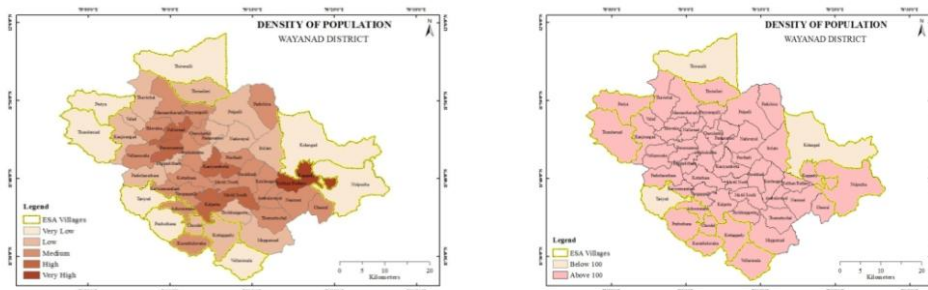


Figure 3 & 4. Density of Population.

Land use/land cover in Wayanad District

The total area of the district were 2136 sq km, share of the area devoted to agricultural land uses is 1165 sq km, which constitute more than half percentages of land utilization. Forests covers 852.61 sq km, which shares 39.89 % of the total area and second among the types of land use. The significance is that agricultural land surrounded by forested land from all sides. The expansion of agricultural land is the main threat of biodiversity of the region. The built up areas occupies 0.72 % of total area, which is a low share when comparing with other districts of Kerala. Growth and Urban agglomeration are at low phase except Kalpetta and Mananthavady.

Table. 3: Land Use/ Land Cover in Wayanad district.

Land Use/Land cover	Area in Sq km	Area in %
Agricultural Land	1165	54.54
Built up	15.58	0.72
Forest	852.61	39.89
Grazing Lands	7.95	0.37
Waste Lands	70.76	3.31
Water Bodies	24.79	1.16
Wet Lands	0.23	0.01
Total	2136	100

Source: Compiled from KSLUB and KSREC reports

Land use versus ESA

The basic criteria adopted by working group to delineate as Natural Landscape is the villages with sixty percentage forest areas as Natural Landscape and the villages having more than sixty percentages of forest area is considered an ESA where agricultural and economic use of the land is strictly regulated by Government. Working Group assigned 13 villages of the district as ESA. As per the present investigation only five ESA villages (Noolpuzha-78%, Periya-82.76%, Thirunelli-81.18%, Thondernadu-88.55%, Thrissilleri-81.5%) have more than sixty percentages of forest area and other eight villages have low percentage of forest area than the criteria. The committee excluded some villages having more than sixty percentage of forested area like Kuppady (85.16 %), Mannanthavady (67%), Padinharathara (71.9%), Thavinhall (81.02%), Valad (85.37%), Vellamunda (66.37%).



Figure 5. Land Use/ Land Cover.

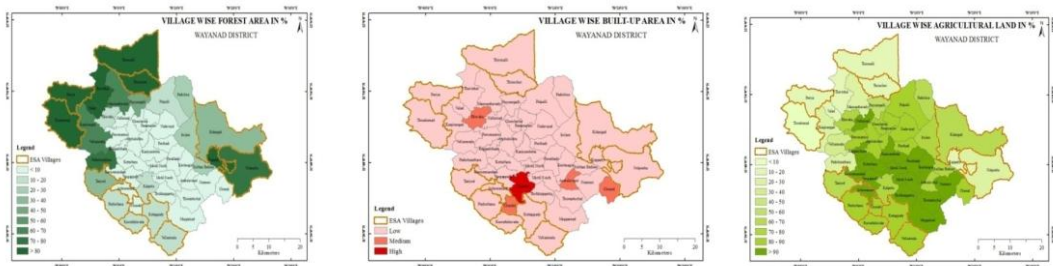


Figure 6. Wayanad district - Percentage share of Villages in Land use/Land cover .

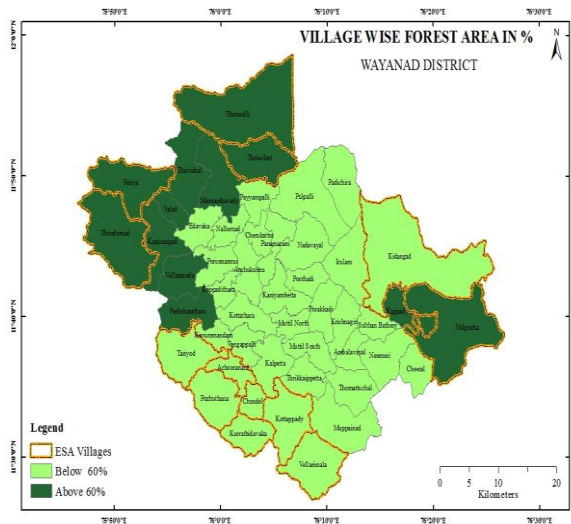


Figure 8. Wayanad district - Village wise forest area and criteria of HLWG

Conclusions

The autocratic regulations for environmental conservation without prior consent of local people can put society in a kind of unrest. In Wayanad case the emergence of Malayora Karshaka Samiti in protecting the rights of farmers, are getting maximum highlight in daily news papers. In this context the present study throw light on the situation of local people and following observations are being laid out;

The expert committees have created controversies in implementation of its regulation which make the people in unrest. The proposed solutions and techniques for conservation and development is not sound and it failed to address sustainability of Western Ghat region. The use of remotely sensed data without proper ground truth verification reduces reliability of report. Many villages with significant biodiversity areas were excluded from ESA. There are great contradiction with ground reality and basic parameters used to classify ESA like density of population and percentage of forest area. More than 8 lakh population resides in the district and among them most vulnerable section of societies like tribes are also concentrated in demarcated ESA villages. District fall among the lowest in many socio-economic parameters such as literacy and urbanization etc. The area is a major hub of plantation oriented and spice producing area, not only in the state but also in the country.

Population is the one of basic parameter for declaration of ESA and therefore estimation of future population is necessary to assess the stress of population upon environment and biodiversity. It is clear that the population of the district is increasing, but there is sharp declining in population growth rate in the last decades. It is agreed that even a small positive change in population has its own impact on environment, but where do this huge population will be rehabilitated?

The strict regulations in land use and developmental activities, freezing of current land use such as monocultural plantation, complete ban of mining, quarries, hydropower projects industries and restrictions on construction of road and railway will bring constrains in the 'development' of the region. The thought less conservation for sustainability of Western Ghat may leads ignorance of population while focusing nature only, and here is the 'controversy arise as nature of development and development of nature' and environmental protection versus agricultural, commercial, industrial, residential land use of existing ecologically sensitive areas. A new and a balanced approach should be adopted for implementation in a practical sense with a clear view of ground realities which will fulfill social, ecological and economic aspirations of the people in question.

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