ENVIRONMENTAL POLITICS; AN EVALUATIVE STUDY ABOUT DEGRADATION OF ECOSYSTEM OF WAYANAD ON THE PERSPECTIVE OF FLOOD HAVOC IN KERALA 2018

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ABSTRACT

In August 2018, a severe flood affected the South Indian States, especially in Kerala due to unusually high rainfall during the Mansoon. It was the worst flood in Kerala in nearly a century. A massive landslide and flood took place in all over the Kerala, and the intensity of havoc was very severe in Wayanad, as one of the most sensitive bio diversity area in Western Ghats The Wayanad (a geographical area in Sahyadri Hills) is one of the sensitive zone in western Ghats and this is the largest biodiversity area in western Ghats with varied flora and fauna and landscapes. Western Ghats or Sahyadri have predominant role on determining the climate pattern of peninsular India. Numbers of previous studies have warned about any inhuman or unscientific intervention over these area may badly affect the ecosystem of Western Ghats. The recent studies of Sri Madhav Gadgil and Sri Kasturirangan are underlined once again to the importance of preserving the eco biodiversity of Wayanad and Western Ghats. But contradictory to the expert advice and warning a vertical infraction happened from top to bottom. A naked law breaching occurred against preservation of environment. Land encroachment, deforestation, agriculture migration, unscientific constructions of dams, absence of drainage and canals, unlawfully constructed buildings and roads, tourism, erosion etc are some of the reasons of degradation of our environment.

This study analyzes the reasons for the degradation of ecosystem of Wayanad and factors responsible for massive environmental disaster which happened all over the Wayanad. Study focuses to the role of corporate interest who undermine the governmental and legal measures of environmental sustainability. This study tries to suggest some remedial measures for protecting the ecosystem of Wayanad on the basis of Gadgil Report.

Keywords: Degradation, Sahyadri, Western Ghat, Ecological Sensitive Area (ESA)

Introduction

The Western Ghats in India is a UNESCO World Heritage Site and one of the "hotspots" of biological diversity in the world. The Wayanad district is southern tip of the Deccan plateau includes part of the Western Ghats and rich in biodiversity with a high percentage of endemism; for instance about 300 species out of an estimated 2000 species of flowering plants endemic to Western Ghats are found in this district. The landscape diversity of the district varies from

forests, bushes, thickets, rocky grass lands, fallow fields, springs, streams, canals and wetlands- a fine example of a heterogeneous ecosystem in which a number of highly useful but endangered plants and animals have been reported. Many species in this district are included in the Red Data Book of the Botanical Survey of India and a large number of once commonly available species to communities have now become very rare or extinct. Various studies of M.S. Swaminathan Research Foundation conducted 10 years ago in the district revealed some 434 flowering plants were conveniently available for use to the local tribal community families, of which 184 are for food, 244 of medicinal use, 7 species for extracting fibers and 68 plants for other purposes like fish poisoning, religious rituals, canes, resins and as other minor Forest Produces. But the recent studies show many of these species are found with extremely low populations in the wilderness.

Now Western Ghats is a very severe victim of human interventions on its environment. In recent years this area witnessed unexpected draughts, unusual heavy rainfall, flood, land sliding, polluted air, and burning heat.



Map -1 Regional Position of Western Ghats and Wayanad

Statement of the problem

The purpose of this study is to identify the causes of human intervention on environment of Wayanad and its impact. The inhuman attitude towards environmental exploitation leading to ecological degradation and climate changes in Wayanad and Western Ghats. Kerala experienced an abnormally high rainfall from 1 June 2018 to 19 August 2018. This resulted in severe flooding in 13 out of 14 districts in the State. As per Indian Meteorological Department data, Kerala (IMD) received 2346.6 mm of rainfall from 1 June 2018 to 19 August 2018 in contrast to an expected 1649.5 mm of rainfall. This rainfall was about 42% above the normal. Further, the rainfall over Kerala during June, July and 1st to 19th of August was 15%, 18% and 164% respectively, above normal.

Due to heavy rainfall, the first onset of flooding occurred towards the end of July. A severe spell of rainfall was experienced at several places on the 8th and 9th of August 2018. The 1- day rainfall of, 255 mm, 254 mm, were recorded at Nilambur (398 mm,)in Malappuram district, Mananthavadi(305 mm) in Wayanad district. This led to further flooding at several places in Mananthavadi and Vythiri in Wayanad district during 8-10, August 2018. Water was released from several dams due to heavy rainfall in their catchments. The water levels in several reservoirs were almost near their Full Reservoir Level (FRL) due to continuous rainfall from 1st of June. Another severe spell of rainfall started from the 14th of August and continued till the 19th of August, resulting in disastrous flooding in 13 out of 14 districts, it has been found that the rainfall depths recorded during the 15-17, August 2018 were comparable to the severe storm that occurred in the year 1924. These data point the finger to a drastic changes in the climate of Wayanad and Kerala.

The basic hypothesis is that the ecosystem of Western Ghats has been sabotage due to adverse impact of misappropriate exploitation of humans. Political influence and corporate interests have significantly accelerated the level of ecological degradation. In summer season the temperatures of South Peninsular India has increased due to the deforestation and unscientific construction of concrete surfaces of roads and building have covered the vegetative landscape and enhancing the solar reflectivity within rural and urban areas.

This study put forward a new concept namely, Environmental Politics, which means Political pressures and political manipulation has adversely influenced the proper implementation of Environmental laws .The landless tribal group encroached the reserved forest in all over the Wayanad and began their settlement with the support of various political parties. Actually these tribal people are the victim of land encroachment of migrants farmers and alienated from their home settlement and all their lands were lost or encroached by migrants settlers .The Government hitherto didn't take any adequate steps to resettle the tribal people from encroached Forest. The corporate planters and tourist land mafia's invasions to this region are causing massive changes in land use pattern. A massive filling up of paddy field and wet land , hills excavation and rock mining are frequent ,which have made negative impact on environment

The analysis is divided into three main parts. The first section of this study introduces the causes of ecological degradation of Wayanad and Western Ghats. The second section is a compilation of the analysis of the reasons for flood havoc, human intervention on bio diversity of western Ghats. The effects, implementation strategies, and analytical evaluation of Gadgil and Kasturirangan Report, including a critical evaluation of environmental politics, measures and implication of governmental scheme for preserving biodiversity of Wayanad. The final section provides recommendation and suggestion for improving the ecological diversity in region.. This study entailed an examination of the land use, development of forestation, green friendly vegetative farming, eco friendly construction and mining.

Objectives of the Study

The overall goal of this paper is to investigate the reasons for degradation of ecosystem of Wayanad. The specific objectives of this work is to analyse the role of environmental politics and social factors, which adversely affect the sustainable ecosystem in Western Ghats. This study aims to find out the environmental and human reasons for the flood havoc hit in Kerala 2018.

Hypotheses

The ecosystem of Western Ghats has sabotaged due to adverse impact of Human interventions. Environmental politics has a key role for degradation of biodiversity of Wayanad and Western Ghats

Diluted political and legal policy of Government has accelerated the unscientific exploitations in Western Ghats

Methodology

In the present study the following methodology has been adopted. Analytical and descriptive methods are used for evaluating the various study reports. To understand the present condition of ecological diversity of western Ghats and Wayanad, field surveys have been undertaken to generate primary data. The data from secondary sources like hand book of western Ghats, Indian Meteorological Department data, Land Survey Board, Forest Reports etc. have also been taken into consideration for the study. Finally, data collected from primary and secondary processed and analysed . Environmental politics has several unique sources has been characteristics that make its analysis significantly different from most policy fields. First, environmental politics does not center on a single discursive frame. Rather, it has multiple discursive frames that define distinct fields of interaction related to the various environmental issues. Secondly, there are competing notions of what constitutes the driving forces of environmental degradation, which results in different political approaches that are adopted by distinct communities to forward their particular interests in the adoption of environmental policies. Finally, there are several characteristics of environmental politics that make its study unique. This includes: a large foundation presence, a well developed counter-movement, the importance of science in defining environmental issues, and the potential for dramatic incidents to shift environmental policies. Together, these factors overlay the traditional approaches to the study of politics. A combined approach that recognizes both the common and unique factors that comprise environmental politics offers the best approach on this topic

Literature Review

Dr.Rebecca Gillapsy, 'Environmental Sustainability'.

Environmental Sustainability allows for the needs of man to be met without jeopardizing ability of future generations to meet their need .environmental sustainability including sustainable agriculture, forestry and energy.

Gamble (1915-1936) 'Flora of the Presidency of Madras'. Most significant explorations in Peninsular India were made by Gamble (1915-1936) published ' 'Flora of the Presidency of Madras'. Till date these floras are used/ referred as the base line data on the plant resources of Peninsular India. After independence Botanical Survey of India was reorganized in 1955 and various parts of the country were explored. In 1966 a significant publication by Santapau and Kapadia came in the form of 'The Orchids of Bombay'. Blatter S. J. (1926) came up with 'The Palms of British India and Ceylon', Matthew (1982-1990) is another stalwart in the field of Indian plant taxonomy. His notable publication is 'The Flora of Tamilnadu Carnatic and Illustrations on the Flora of Tamilnadu Carnatic'. These floras are known for their critical descriptions and very fine illustrations. Recently Ansari and Balakrishnan (1994) have published Family Eriocaulaceae in India which so far was a neglected group as family has very minute flowers. This has been revised in 2009.

Madhav Gadgil, WGEEP Report:

Ministry of Environment and forests of India set up in March 2010 an expert panel (Gadgil Commission) to find a strategy for conserving Western Ghat. Commission submitted the report to the Government of India on 31st August 2011. The Commission recommends as Western Ghat as an Ecological Sensitive Area (ESA). The Commission classified 142 Talukes in the Western Ghat boundary in to Ecological Zones (ESZ) 1,2 and 3. Gadgil Committee report specifies that the present system of Governance of the environment should be changed.

The Committee on Government Assurances in the Rajya Sabha has urged the Ministry of Environment, Forest and Climate Change to constitute a committee to address the issues and grievances of local people in Western Ghats. The committee has submitted a report in this regard.

K. Kasturirangan Report on Western Ghats. Important observations made by the committee is over 56,000 square kilometres of ecologically sensitive areas (ESA) in the Western Ghats could not be earmarked as 'no-go' zones due to State governments' 'insensitivity'. The recent monsoon floods in Kerala and parts of Karnataka should serve as alarm bells for the administrations in the States of Goa, Gujarat, Maharashtra, Kerala, Tamil Nadu and Karnataka, which have failed to mark ESA in the Western Ghats. It defined the boundaries of the Western Ghats for the purposes of ecological management. It proposed that this entire area be designated as ecologically sensitive area (ESA).Within this area, smaller regions were to be identified as ecologically sensitive zones (ESZ) I, II or III based on their existing condition and nature of threat.It proposed to divide the area into about 2,200 grids, of which 75 per cent would fall under ESZ I or II or under already existing protected areas such as wildlife sanctuaries or natural parks.The committee proposed a Western Ghats Ecology Authority to regulate these activities in the area.

Ecological Degradation and Environmental Sustainability Defined

The ecological degradation is the deterioration of the environment through depletion of resources such as air, water, and soil, the destruction of ecosystem, and habitat, and extinction of wildlife and pollution of environment.

Environmental sustainability is defined as responsible interaction with the environment to avoid depletion or degradation of natural resources and allow for long term environmental quality.

The Western Ghats covers six states namely Gujarat, Maharashtra, Karnataka, Kerala, Goa and Tamil Nadu. It has a wide range of vegetation and topographical features. Biogeographically, the hill chain of the Western Ghats constitutes the Malabar province of the Oriental realm, running parallel to the west coast of India for around 1600 km. Rising up from a relatively narrow strip of coast at its western border, the hills reach up to a height of 2800 m before they merge to the east altitude of 500-600 with the Deccan plateau at an m. The average width of this mountain range is about 100 km. The Western Ghats (known as Sahyadri ranges in Sanskrit) has to its credit a wide range of species diversity, 4500 plant species

out of which 35 percent are endemic. Levels of endemism in this area are high - nearly 2000 species of higher plants, 84 species of fishes, 87 species of amphibians, 89 species of reptiles, 15 species of birds and 12 species of mammals are endemic to the Western Ghats (Daniel, 1997). This bioregion is highly species rich and under constant threat due to human pressure and has within it many hotspots (region recognised to hold diverse life forms which requires conservation) regions like the forests of Mahabaleshwar, hills of Coimbatore, Pulneys, Tirunelveli, Nilgiris, places like Nagarahole, Silent Valley etc. These are some of the places that harbour rich diversity of endangered species both in the aquatic and terrestrial ecosystems. The western slopes of the Ghats have a natural cover of evergreen forest, which changes to moist and then dry deciduous types as one comes to the eastern slopes. The vegetation reaches its highest diversity towards the southern tip in Kerala with its high statured, rich tropical rain forests. The commercially most important species, teak, however, grows best in tracts of more moderate rainfall where the natural vegetation is of the moist deciduous type. The Western Ghats are second only to the Eastern Himalaya as a treasure trove of biological diversity in India. Originally recognized as among the several global ,hotspots of biodiversity', the Western Ghats along with its geographical extension in the wet zone of Sri Lanka are now also considered one of the eight ,hottest hot spots' of biodiversity. The plant and animal species known to be from the Western Ghats that are categorized by the IUCN (International Union for Conservation of Natural Resources) as endangered and vulnerable. Hence, there is an urgent need for the conservation of these species before they get vanished.

Importance of Wayanad Region in preserving biodiversity of Western Ghats

Wayanad is a small hill district in Kerala with an area of 2131 km comprising of three Tehsils viz. Vythiry, Mananthawady and Sulthan Bathery. The District is a picturesque plateau situated at a height between 700 meters and 2100 meters above the sea level nested among the mountains of the Western Ghats on the eastern portion of North Kerala and on the sides of TamilNadu and Karnataka States. The district is also divided into four blocks- Kalpetta, Mananthawady,Panamaram and Sulthan Bathery. The district is having 25 Gram Panchayats and three municipalities (Kalpetta, Sulthan Bathery, Mananthavady). It has a population of about 8.16 lakh of which 90% depend upon agriculture for sustenance. There are 40,129 farmers,

74,813 agricultural labourers and 17,413 plantation labourers in the district. Another 37,267 people earn their livelihood from animal husbandry and forest produce (Source: District Project Draft Development, Wayanad, 2001, Govt. of Kerala). The district has highest tribal population of about 1.25 lakh consisting 17% of the total population. Even though, the term Wayanad is derived from the word "Vayal Nadu", which means the land of paddy fields now it is famous for its spices and coffee plantations. The major crops grown here are coffee, pepper, tea, cardamom, arecanut etc. These are perennial cash crops. Till not very long ago, Wayanad had plenty of water. But today the entire region is facing drought due to change in rainfall pattern, unchecked deforestation and large-scale conversion of paddy fields into plantations. In 1980, there were 30,000 hectares of paddy fields in Wayanad. It has shrunk by more than 76 percent to 7000 hectare at present. The ecosystem and environment of the district, which is famous for its biodiversity is greatly endangered today. Afforestation, protection of paddy fields, conservation of water resources and artificial recharge to groundwater are to be carried out in the district to protect the ecosystem and environment of Wayanad, which will in turn reduce the impact of drought on agriculture. Almost the entire Wayanad district is drained by Kabani and its three main tributaries viz. Panamaram, Mananthawady and Thirunelli. Other tributaries include Bavelipuzha and Noolpuzha. Kabani River is one of the three east flowing rivers in Kerala and its tributaries carved the present landscape of the district.

Rainfall and Climate: Wayanad experiences salubrious climate with mean rainfall of 2786 mm. Lakkidi, Vythiri and Meppady are the high rainfall experiencing areas. It is seen that southern, southwestern and northeastern areas of the district receive more than 3000 mm of annual normal rainfall. Eastern and northeastern areas receive lesser rainfall of less than 1500 mm. Some areas bordering Karnataka state experience still lower rainfall with some areas falling under rain shadow region. An increase in rainfall is observed towards south, southwest and northeast. The SW and NE monsoons contribute rainfall in the area with 80 % of the rainfall from SW monsoon. The month of June experiences abundant rainfall and is the wettest month. The months of July, August and October also receive heavy rainfall.

Geomorphology and Soil types :The district may be divided into three physiographic zones-Wayanad plateau (WP), Central Sahyadri High land (CH) and Mountainous regions of Central

Sahyadri (MR) as per Soil Survey Organisation . On the basis of topographic features the area can be divided into different physiographic zones like high ranges with rugged topography, high ranges with moderately rugged topography, intermountain valley and flood plains. High ranges with rugged topography include hill ranges in the west, northwest and southwestern part of Wayanad district and elevation ranges from 1400 to 2100 m amsl. This area is occupied by dense mixed jungles and is having rugged topography with steep slopes and narrow valleys. Hill ranges along the eastern part and isolated hills come under high ranges with moderately rugged topography. The altitude of the physiographic zones ranges between 1000 and 1400 m amsl with moderate slope. Intermontane valleys are the valleys between high ranges. These areas are occupied by colluvium formed by depositional processes. Erosional intermontane valleys are also reported. The flood plains with alluvial thickness of more than 10 m are quite common and form productive aquifers. The landform units identified in Wayanad are alluvial plain, flood plain, valley fill, linear ridge, hillcrest, sloping terrain, rocky slope (scarp face) and hilly terrain. The flood plain and Ground Water Information apparent Booklet of Wayanad District 5 valley fill are the major fluvial landforms whereas moderately sloping terrain, highly sloping terrain ,rocky slope (scarp face), linear ridge and hillcrest are major denudational landform units.

Rivers: Due to the peculiar terrain, there are east-flowing and west-flowing streams in Wayanad. Among the 44 major rivers of Kerala, the east-flowing Kabani and its tributaries water almost the entire area of Wayanad district. With a total catchment area of 1934.50 sq. km, the river Kabani has a basin length of 56 km in Wayanad. The river has three major tributaries viz. Panamaram Puzha, Mnanthavady Puzha and Bavali Puzha, and 7 minor tributaries. These rivers are the fertile irrigation source of Wayanad's agriculture history.

Vegetation: Wayanad district converges different vegetation types along the windward and leeward side of the Western Ghats and dominated by Malabar floristic elements and the total area under forests in Wayanad is 787 sq. km. It is an east sloping mid-level plateau, lies in the northwest corner of the Nilgiris, gently undulating and abruptly descending in the west to Kerala plains but 16 merging imperceptibly with the Mysore plateau to the east. The ChembraVellarimala mountain ranges along the southwestern corner of Wayanad closely similar

to the Nilgiris and the mountains are in tenuous connection with the Nilambur forests and again with the Wayanad western slope forests. Wayanad descends extremely steeply to the plains of Kerala to the west with individual mountain peaks like Sugandhagiri-Amba hills, Kurichiarmala and Banasuramala. These hill ranges although very attenuated and broken in four distinct locations, skirts around the entire west and north face of Wayanad. The northeastern corner of Wayanad rises up to a hill range called the Brahmagiris. This forms the western and southwestern border of the Coorg plateau. The Brahmagiri slope also extends towards southeast into the Wayanad plateau almost up to the Pulpally discontinuity. There are a few scattered very small pockets of forests on the northern and western parts of the plateau. At present we can see along the state border on the eastern edge of Wayanad, there is highly degraded belt of forests stretching as the part of the new construction of roads and extension activities. Most of the natural vegetation of these areas has been replaced by Coffee, Tea, Eucalyptus, Banana and Rubber plantations. The natural flora of this area is that of the evergreen and moist deciduous forests consisting of a mixture of evergreen and deciduous elements.

Tropical Forest The Wayanad is a land of thick forest and diversed vegetation. According to the study of Chandrasekharan (1962c) and Champion and Seth (1968) the natural vegetation of Wayanad can be broadly classified into the following types:

- 1. West-coast tropical evergreen forests (evergreen)
- 2. West-coast tropical semi-evergreen forests (semi-evergreen)
- 3. Southern moist-mixed deciduous forests (moist deciduous)
- 4. Southern dry-mixed deciduous forests (dry deciduous)
- 5. Southern montane wet-temperate forests (shola)
- 6. Southern wet-montane grasslands (grasslands)

West-coast tropical evergreen forests : This forest type is the major vegetation in the Meppady, Kalpetta Periya and Manathavady forest ranges at an altitude ranging from 600m to 1300m and is continuous with the Nilgiri-Nilambur hill ranges towards south and southwest and Aralam-Coorg ranges towards north. These forests are common around the hills and valleys of Vythiri, Chembra, Chooralmala, Vaduvanchal, Thalimala, Mundakai, Manikkunnumala-Nalukettumchola, Sugandhagiri, Pozhuthana, Thariodu, Kurichiarmala. Banasuramala,

Niravilpuzha, Kunjome, Chanthanathodu, Periya, Palchuram, Narinirangimala, Makkimala, Kambamala and Thirunelli. These forests exhibit luxuriant growth, particularly of trees and woody climbers, and the canopy is closed. High humidity, shade and sheltered condition provide ideal habitat for various flora and fauna in western Ghats region.

Southern moist-mixed deciduous forests Moist deciduous forest is the dominant vegetation type in the Wayanad Wildlife Sanctuary (Muthanga, Begur, Tholpetty forest ranges) and Kurichiad, Naikkuppa, Pathiri and Kuruva forest areas of Chedeleth range (elevation of 700 m-900 m). During wet season, because of the thick foliage, the canopy looks similar to that of semievergreen forests. During January-April, the trees become more or less deciduous but the forests never become deciduous in total. The leafless period varies from a few weeks to five months depending on the species and Ground flora is rich with medicinal plants. This forest type is seen in the district above 1500 m altitude (1500 m-2000 m), and is essentially a stunted evergreen forest. It is found in Chembra peak, Vellarimala, Kattimattam, Kurichiarmala, Banasuramala and Brahmagiri. The forests of Western Ghats, in view of their floristic diversity and numerous multipurpose species, are considered a varietal storehouse of economically important plants. In addition to the numerous timber and wood fuel plants, these forests provide a wealth of Non-Wood Forest Products which are of particular significance to forest-dependent people and small scale local industries. Non wood forest products provide fibre, food (edible fruits, nuts, spices, condiments etc.), extractive products(gums, resins and oleo-resins; tans and dyes; essential oils) and medicines. Western Ghats region is also a rich gene pool of cultivated plants. It contains wild relatives of many different crops like rice, sugarcane, black pepper, ginger ,turmeric etc. These wild relatives play a vital role as genetic sources in plant breeding programmes. There are also in this region a large number of species of horticultural value.

Tourism industry

As a remote region of the virgin rainforests and mist-clad mountain ranges, Wayanad attracts over 9.4 lakhs of tourists a year (2017) including domestic and foreign travelers. The important spots of attraction include places of historical importance (Edakkal caves, Pazhassi tomb), nature's trails (Wayanad Wildlife Sanctuary, Chembra peak, Lakkidi, Pookkode lake, Karlad

lake), places of religious importance (Thirunelly temple, Valliyoorkavu temple, Pallikkunnu church), water falls (Kanthan para, Meenmutty, Soochippara), and dam sites (Banasurasagar, Karapuzha) etc. These tourist spots have been growing day today and Wayanad district is becoming an emerging tourism destination in the Country. Tourist Land mafias and corporate business groups trying to make maximum profit in upcoming boost in Tourism field. Any how if governmen is not ready to implement any immediate measures to prevent such massive exploitation, our environmental equilibrium will disappear soon.

Causes of devastating flood havoc 2018

Extreme precipitation events and flooding that cause losses to human lives and infrastructure have increased under the warming climate. In August 2018, the state of Kerala (India) witnessed large-scale flooding, which affected millions of 10 people and caused 400 or more deaths. Heavy losses to life, property and crops etc. had been reported. Kerala experienced 53% above normal rainfall during the monsoon season (till August 21st) of 2018. More over after few days all these flooded areas unexpectedly faced a severe draughts and immediately decreased the ground water level in all over the Kerala. These geomorphic changes pointed out to a fact that Western Ghats regions are facing unprecedented climate changes in these days .There are number of reasons for the flood and unpredicted changes on seasons of Wayanad.

Nature Causes: The unusually heavy rain fall in a short period of time caused the flood and triggered landslides that killed many people. The unusual rainfall pattern may be attributed to the global climate change. Another natural reason is due to ecological degradation and deforestation in Western Ghats area causes for the Arabian sea is becoming warmer and which led to surge in moisture level in the sea and they move in to the subcontinent. This may have caused the unprecedented torrential rainfall.



Picture -1 Flood Affected areas in Western Ghats

Human Causes

Development Activities Encroachment, deforestation, quarrying, rocks and building, resorts and huge buildings constructions on ecologically fragile land and unauthorized construction. Quarrying along with deforestation intensified the land slides. Wet land lakes that acted as natural barriers have disappeared due to urbanization and construction of infrastructure.

Cities were built and expanded on leveled farmland, blocking the natural water way. The Gadgil committee report already predicted the disaster and gave recommendation to stop the havoc. The state government and local bodies are failed to handle the water resources management. The state government should have taken seriously and should take suitable measures to lower the flood risk such as building proper canals and reservoir

Irrespective of political bias the political leadership should take the initiatives to restrict the building of any unscientific new dams or check dams. An alternative irrigation plan has to find out for helping farmers for farming without affecting natural diversity. The Government has not restricted rampant quarrying on wet lands. It diluted conservation of paddy land amendment act 2008 through an amendment that gave easier clearance to corporate projects. This led to large scale land reclamations, environmental degradation and ground water depletion. The Malabar ornithological surveys 2010 has opinioned that the wayanad is a critical habitat and endangered species of birds and animals. The team sighted 200 species of birds including

14 endemic species and 30 species of raptors. The study observes that seven species of raptors were breeding in Wayanad. The Ministry of Environment and forest in collaboration with the Zooogical survey of India has released a comprehensive document on critically endangered animal species in |India . In this study reports , major endangered species were found in western ghats and Wayanad hills. Spoon billed sandpiper, the Kerala Indian frog and Lion tailed monkey are the some of them. The above study reveals that a narrow human intervention on environment may lead to disappearance of entire species from the top of the earth.

Land sliding Tendency of Western Ghats Zone

According to scientists, landslides occur when human intervention – such as building high rises, stone quarrying and the construction of roads – increases in landslide prone areas. They say prolonged and intense rainfall can trigger major landslides in these areas, and deforestation, obstruction of streams and cultivation of crops whose roots lack the capability to hold the soil together on slopes accelerates this process.Geologist KG Thara, former faculty head at the Institute of Land and Disaster Management in Thiruvananthapuram, said those who promote unscientific development practices should be held accountable for landslides. "It is a major cause of concern that Kerala has been witnessing an increase in the number of landslides," she said. "Construction of resorts and high rises has increased in landslide-prone areas. It is unscientific, and bureaucrats who grant permission for these projects should be held accountable for the loss of human lives and property."The 2016 disaster management plan also pointed fingers at construction work in landslide-prone zones. It recommended that all activities that trigger landslides should be regulated strictly.



(*Map 2* Credit : Land sliding Zone map. State Disaster Management Authority)

Immediate drought after a series of flood

A few days after receiving one of the highest rainfalls in a century, Kerala was caught under the threat of severe drought. Water level in wells, ponds and rivers have recorded lowest levels and some wells even collapsed. The water level in wells, especially in high ranges of western Ghats district has come down by 20 feet in just a matter of 15 days. The Government has directed the State council for Science, Technology & Environment to carry out studies on the phenomenon after floods across the state and suggest possible solutions to the problem.

A.B. Anita, executive director, Centre for Water Resource Development Management (CWRDM), an autonomous research institution under the State government, said heavy run-off of the top soil in the upland areas and the siltation in the rivers were the reasons for the falling water level. The top soil in the hills and upland areas had been removed in the flash floods to a depth of up to two meters in many places. As the top soil was shaved off, it ruined the hills capacity to sponge in rainwater, she said. Ms. Anita cited ecological destruction caused by deforestation, harmful land use in the upland areas and sand mining in the streams and rivers as having contributed to the top soil run-off and siltation. This was exacerbated by the impact of climate change at the macro level.

Echoing her views, experts at the National Institute of Technology, Calicut, (NIT-C) said it was usual for the water level in the rivers and domestic wells to fall after fluvial floods. "Normally, a river flows through the sand of its own bearing till the mouth. However, this time the discharge has been full, taking the sand and the rocks in the youth-stage along with the floods. "So the water level in the rivers comes down and when the river water level is reduced, the groundwater table also does not get replenished since the rivers and groundwater table are connected," said K. Saseendran Geologist and Professor at the NIT-C.

Environmental Politics and Role of a welfare Government for protecting ecosystem

In modern state system all the governments are responsible for the sustainable development of environment and uplift of the living condition of its population. Wide spread climate change and global warming has immensely forced the nations towards the sustainable development. Though national government has important role in this context. Policy making, educating community & many more activities lies on them. Internationally most of the developing countries have imposed rules on clean environment. National government can impose rules and policies while provincial authorities can practically implement the good environmental practices. International monitoring agencies are also playing major role by funding environmentally sound projects. This has been the practice and it has been added to the accounting practices where feasibility reports are combine to a sustainability reporting. Environment protection is another important role where government's responsibility is to codify laws regarding pollution, convention and sustainable uses of natural resources. Environmental challenges in various bio diversity in balances has been wide spread more over the world. Improper Land Use Planning and Bio diversity in balances to the Conservation of Micro ecosystems is challenging to whole nations. Western Ghats is one of the great victims of land degradation due to Soil Erosion, depletion forests, Waste Disposal, Loss of Biodiversity and Inland water Pollution.

Developing risk management strategies are the other responsibility to a government where major natural disasters can be overcome by minimum damage to the community. Earth slides, floods, volcanoes, hurricanes & other natural disasters can be estimated by professional bodies and necessary steps could be undertaken. In Kerala post flood era has been the elysium for the

sustainable development. Government authorities urge to impose policies and programs on conservation and prevention of the environment.

While laws and policies imposed, Kerala government is boosted on all the blooming programs. However common conflicts on human and nature issues are still prevailing in most of the rural areas. Environmental protection is a practice of protecting the environment, on individual, organizational or governmental level, for the benefit of the natural environment and humans. Due to the pressures of population and our technology the biophysical environment is being degraded, sometimes permanently. This has been recognized and governments began placing restraints on activities that caused environmental degradation

Global warming and climate change is a whistle blowing topic in the present world. While men stepping in to the moon on one hand and on the other hand vastly destructing the natural environmental balance. Today the challenges in this sector have been identified and materialize in all ends throughout the world. Therefore number of environmental threats and challenges are prevailing. Improper Land Use Planning, inappropriate planning of usage of Land, Depreciation of Forest Cover (Deforestation) Reduction of remaining forests, Land Deprivation (Soil Erosion, River Sedimentation; Desertification,) ,Insufficiency of Drinking Water to the humans, Environmental Pollution (Air, Water & Soil), Loss of Biodiversity (Degradation and loss of Natural Habitats),Green House Gas Emission and Climate Change, Natural Disasters and Earth Slides, Unsound Management of Natural Resources, Unsustainable Development Activities (Unsuitable Agriculture Expansion and Settlements),Uncontrolled Mining of Sand and other Minerals etc are the main challenges which are faced by the mankind. As a country we have to have policies and laws to protect the alienation of forest resources to stop pirating the genetic material, plant serum, plant species or the traditional knowledge. Therefore government should ensure above main objectives before implementing any policies.

Political and corporate Lobbying on Environment

Influence of political and corporate lobbying are the main reasons for sabotage of Governments policy and make hindrances for implication for environmental laws and programs. The society urge to government to promote sound environmental policies, and the adoption of newer and innovative technologies that improve environmental protections and conserve energy and water. As a welfare state, government has to take urgent action to protect environment and implement sustainable development programs for the well being of nature and society. A serious and self determined political leadership can only take initiative steps for a sustainable measures with irrespective of color of flags or political pressures.

As communities in the Western Ghats the Wayanad region and its fragile ecology are turned as a hot subjects of political debate not only in Wayanad but also in entire Kerala. With settlers and land mafias resisting any governmental action against encroachments and illegal constructions, an environmental catastrophe is now lurking behind in areas like Muthanga, Thovarimala, Irulam and Vythiri in addition to Pulpally and Mananthavady. In Wayanad, plantations, and resorts and hotel mafias are causing massive changes in land use patterns. Misusing the covetousness of the local community, land mafias are now thriving in Wayanad and other parts of Western Ghats causing enormous damage to the land and livelihood. They seem to have learned no lesson from the worst floods of August 2018 in Wayanad . Most of the region had witnessed 12 major landslides and monsoon-related deaths in the floods. Whatever be the stand of major political parties, two recent official reports, one prepared by a parliamentary sub-committee and another by the Kerala Revenue Department, detail the macro- and micro-level impact of human activity in Wayanad.. The reports say the region has already lost much of its natural wealth and warn that any further delay in addressing the encroachment issue would mean the end of the hill station. According to botanist Jomy Augustine, botanist and professor at St Thomas College in Palai, massive changes occurred during recent years in land use pattern as a result of encroachments.

Tribal's Forest Land Encroachment in Wayanad and Role of political Parties: Since couple of decades tribal land encroachment struggle is a common phenomenon in all over the Wayanad. Commonly Tribal People are considered as non political and impartial .but these years they are

politically organized under various political parties and some extremist political group has great influence among them. These political interferences make them so violent to capture more forest land as their settlement. The famous Muthanga agitation and at present Thovarimala agitations are also one side of such hidden influence of vested interest of main stream political parties. But these political parties have failed to find out a permanent solution for Tribal peoples ever facing problem of landlessness. Instead of that these political parties add fuel to the fire over Tribal sentiments. As indigenous population adivasis (Tribes) of Kerala live in the forests and mountains of Western Ghats, bordering Karnataka and Tamil Nadu. According to the 2011 census highest number of tribals are living in Wayanad. (1,36,062). As part of social mobility of tribals, they are evicted from their natural habitat by Government and rehabilitated in farm land near town areas. But tribes, uncomfortable with settled agriculture, leased out their lands to settlers. Taking advantage of Kerala's tenancy laws, these settlers succeeded in confiscating the tribal's lands. Even tribes which benefited from land allocations got into debt traps and had to become bonded labourers. Most of the Tribal families have lost their cultivation land and they alienated from their home land. All alternative Governments were implemented various land distribution programs for adivasis with hidden political motives. But these programs were couldn't achieve proposed results. Government programmes have not significantly helped the tribals in raising their economic status. The Government policy had led to ruthless exploitation of the tribals in various ways as it favoured the landlords, moneylenders. So Tribals are trying to encroach their alienated forest land and struggling to find out livelihood as forest dwellers. These encroachments of reserved forest are causing to destroying forest land for farming and settlement in some extent.

Sustainable Biodiversity: Recommendation of Mr. Madhav Gadgil and Mr. Kasturirangan Mr. Madhav Gadgil Report (WGEEP 2010)

The Ministry of Environment and Forests (MoEF) set up in March 2010 an expert panel under the chairmanship of ecologist Prof Madhav Gadgil to suggest ways to preserve the Ghats in best possible manner. 'The Gadgil panel went by forest types above a certain altitude and defined the Western Ghats landscape across 1,29,037 sq km. 'Gadgil's report proposed to declare this entire landscape as ESA(Ecological Sensitive Area), creating three ESZs(Ecological Sensitive Zone)

within it. He prescribed that the existing sanctuaries and ESZ-1 (77000 sq km) would together cover 60 percent of this landscape. The 25 percent lowest priority areas would be marked as ESZ-3 (32000 sq km) to allow all developmental activities with precautions. The remaining 15 percent area would become ESZ-2 (20000 sq km). For example, while no mining would be allowed within ESZ- 1, existing mines could continue in ESZ-2 with a moratorium on new licences. In ESZ-3, new mines could come up. The Gadgil or Western Ghats Ecological Expert Panel (WGEEP) report did not find favour with industry and concerned states. No decision was taken on the report by MoEF

Recommendations of Madhav Gadgil Committee:

- 1. The Western Ghats Ecology Expert Panel (WGEEP) designated the entire hill range as an Ecologically Sensitive Area (ESA).
- 2. The panel, in its report, has classified the 142 taluks in the Western Ghats boundary into Ecologically Sensitive Zones (ESZ) 1, 2 and 3.
- 3. ESZ-1 being of high priority, almost all developmental activities (mining, thermal power plants etc) were restricted in it.
- 4. Gadgil report recommended that "no new dams based on large-scale storage be permitted in Ecologically Sensitive Zone 1.
- 5. Gadgil Committee report specifies that the present system of governance of the environment should be changed. It asked for a bottom to top approach (right from Gram sabhas) rather than a top to bottom approach. It also asked for decentralization and more powers to local authorities.
- The commission recommended constitution of a Western Ghats Ecology Authority (WGEA), as a statutory authority under the Ministry of Environment and Forests, with the powers under Section 3 of the Environment (Protection) Act, 1986.

Ministry of environment and forests kept the Gadgil report in safe custody for eight months with them. It was not available for public discussion as expected by Gadgil committee members. People asked for a copy, but the ministry said it could not be given. When an RTI

petition was filed, it was not given. Then the matter is taken to the Delhi high court and only when the court passed an order, the ministry released the report. The court ordered that all the reports should be put on websites. As many mafias created fear among the people that the Gadgil report is anti-farmer and anti-people, people burnt the Gadgil Committee report and the effigy of the well-known environmentalist, Madhav Gadgil. The problem was that most people had not read it. So, the mining lobby took advantage of this aspect and misled the people. They convinced the people against the report in their favour. The lobby told the people that the report was against farmers and they would have to leave the area. People got really worried. And it is in this background that another committee was appointed to study Gadgil Report, review and suggest measures for implementation

Mr. Kasturirangan High Level Working Group (2012)

In August 2012, then Environment Minister constituted a High-Level Working Group on Western Ghats under Kasturirangan to "examine" the Gadgil Committee report in a "holistic and multidisciplinary fashion in the light of responses received" from states, central ministries and others.

Important observations made by the committee: Over 56,000 square kilometres of ecologically sensitive areas (ESA) in the Western Ghats could not be earmarked as 'no-go' zones due to State governments' 'insensitivity'.

The recent monsoon floods in Kerala and parts of Karnataka should serve as alarm bells for the administrations in the States of Goa, Gujarat, Maharashtra, Kerala, Tamil Nadu and Karnataka, which have failed to mark ESA in the Western Ghats.

Recommendations of Kasturirangan Committee:

- 1. A ban on mining, quarrying and sand mining in ESA.
- 2. No new thermal power projects, but hydro power projects allowed with restrictions.
- 3. Building and construction projects up to 20,000 sq m was to be allowed but townships were to be banned.

- 4. Forest diversion could be allowed with extra safeguards.
- 5. Instead of the total area of Western Ghats, only 37% (i.e. 60,000 sq. km.) of the total area be brought under ESA under Kasturirangan report.
- 6. Distinguished between cultural (58% occupied in the Western Ghats by it like human settlements, agricultural fields and plantations) and natural landscape (90% of it should come under ESA according to the committee).
- 7. Current mining areas in the ESA should be phased out within the next five years, or at the time of expiry of mining lease, whichever is earlier.
- 8. Red industries i.e. which are highly polluting be strictly banned in these areas.
- 9. Kasturirangan report on the Western Ghats has made several pro-farmer recommendations, including the exclusion of inhabited regions and plantations from the purview of ecologically sensitive areas (ESAs).
- 10. The Kasturirangan report had said 123 villages fall under the ESA purview.

Comparison of Gadgil Report and Kasturirangan Report

Whenever we study environment, the evergreen topic of debate is between environment and development. It is tough to achieve a perfect balance. The same happened with both these reports.



If Gadgil report laid too much importance to the environment, Kasturirangan report was biased towards development. Kasturi Rangan report was criticized by many as that it provided loopholes for mining, which if allowed would turn detrimental to the environment, in long-term will affect development too. Kasturirangan report got the tag as anti-environmental soon after its release. But this report was tagged anti-development too by many who fear that their livelihood and interests will be affected.

Gadgil's Western Ghats (Western Ghats landscape across 1,29,037 sq km.) is smaller than that of Kasturirangan's (Western Ghats landscape, according to Kasturirangan is 1,64,280 sq km). Gadgil report marked out 60 percent of the Western Ghats as the highest-priority Ecologically Sensitive Zone (ESZ -1).

Kasturirangan report marks only 37 percent area (but considers wider Western Ghat boundaries) as ESA. Gadgil's report proposed to declare this entire landscape as ESA, creating three ESZs within it. He prescribed that the existing sanctuaries and ESZ-1 would together cover 60 percent of this landscape. The 25 percent lowest priority areas would be marked as ESZ-3 to allow all developmental activities with precautions. The remaining 15 percent area would become ESZ-2. For example, while no mining would be allowed within ESZ-1, existing mines could continue in ESZ-2 with a moratorium on new licences. In ESZ-3, new mines could come up.

The Kasturirangan panel, on the other hand, adopted the criteria followed by the Western Ghats Development Programme of the Planning Commission and identified 188 talukas as its Western Ghats landscape, which worked out to 1,64,280 sq km. He marked 37 percent of this stretch as ESA where hazardous industries, thermal plants or mines would not be allowed. In effect, the restriction level of Kasturirangan's ESA corresponds to that of Gadgil's ESZ-1.Now, according to the Gadgil report, the ESZ-1 areas add up to approximately 77,000 sq km (60 percent of 1,29,037 sq km). Kasturirangan's ESA, on the other hand, accounts for around 60,000 sq km (37 percent of 1,64,280 sq km). That is a reduction of 17,000 sq km in the top priority segment.

Current Political situation about Gadgil and Kasturirangan Reports

Farmers were worried of Gadgil report, fearing their eviction and they fear the same of Kasturirangan report too. Though there are many who treat Kasturirangan report as a more practical report, the truth is that Gadgil report was not anti-farmer. Also, people had misconceptions about Ecologically Fragile Lands (EFL) and Ecologically Sensitive Areas (ESA). Both of them were different concepts under different laws–the first under forest department and the latter under the district administration and pollution control board and remember that protests often are not due to love towards the environment, but often because of fear of eviction or loss of livelihood. Centre issued an office order in November 2013 directing immediate implementation of five proposals in the Kasturirangan report. This was the immediate provocation for the agitation. Later, the central government sought the opinion of the five states in implementing the report. Dialogues were still on and the government had asked the state governments to submit their views on the report.

Ministry of Environment had enough reports (Gadgil and Kasturirangan; Ooman committee was state-level), but still, they didn't take any action. The Kasturirangan panel had submitted its report to the Ministry on April 15, 2013. (Finally) it was put in public domain and also disseminated to all stakeholders including the six Western Ghats states including Gujarat, Karnataka, Maharashtra, Goa, Kerala and Tamil Nadu for feedback and comments. Going with the recommendations of the high-level panel that was headed by Mr. Kasturirangan, the Ministry

has decided to declare the ESA over 37% of the Western Ghats under the Environment Protection Act, 1986.

With the central government deciding to implement the Kasturirangan Committee report on the Western Ghats, there were several protests in Kerala. Even those who opposed the Gadgil Committee report now want it in place of the Kasturirangan Committee report. People now fear that due to illegal mining they would get evicted indirectly.

As Kerala faces its worst floods in several decades, Madhav Gadgil, the author of a landmark report on the conservation of the Western Ghats created said that Kerala Floods are partly manmade. He said the scale of the disaster would have been smaller had the state government and local authorities followed environmental laws.

"Yes, there is an intense rainfall event which has caused this. But I am quite convinced that the last several years' developments in the state have materially compromised its ability to deal with events like this and greatly increased the magnitude of the suffering that we are seeing today. Had proper steps been taken, the scale of the disaster would have been nowhere near what it is today," says Dr. Gadgil. Anyhow all environmental lovers looking forward to Government for taking step to implement all these study reports without delay for protecting the ecological sustainability of Western Ghats.

Recommendation and Suggestion

Environmental conservation should be a practice of protecting the natural environment on Individual, organizations, or Government for the benefit of both the environment and humans. Due to the pressure of over consumption, population, and technology, the biophysical environment is being degraded, sometimes permanently. This has been recognized by Government and publics, have begun planning restraints on activities that cause environmental degradation. Government has to implement new plan for sustainable development of environment urgently in its nature on grass root level. New Tribal settlement in forest land

and encroachment has to be evacuated on urgent basis. For that Government would be find out alternative land for resettlement of tribal people and their farming.

Groundwater Management Strategy. Being a hilly district, Wayanad needs specific water management strategies to suit its physiography. The runoff in the district is high and the groundwater levels in valleys are shallow. High lands are more sensitive to vagaries in climatic conditions and need more attention in the implementation of water conservation and recharge structures. Suitable groundwater conservation and recharge structures for high lands and valleys are to be designed and promoted with people's participation to make it a success. There are numerous soil conservation structures like contour bunding, terrace cultivation, gully plugging etc, which act as water recharge structures in high lands. Construction of such structures is to be promoted in big way in the district. Most of the NGOs working in the district are mainly concentrating on rainwater harvesting practices to do away with the drinking water scarcity problems in high land area. The wide network of drainage developed by the rivers in the district has numerous ideal locations for check dams, which may act as water conservation and recharge structures. As most of the area receives high rainfall, rainwater harvesting for groundwater recharge as well as for storage in tanks for drinking purpose can be promoted by popularizing the techniques on water harvesting. The artificial recharge structures suitable for this district are gully plugs and other soil conservation structures like check dams and roof top rainwater harvesting, Roof top rainwater harvesting can be practiced by all including individuals with a small land.

Wildlife Management: Wildlife should be managed in their own habitat and need to save from human intervention. Animal Rights is one the latest concept of a civilized society. All species have intrinsic rights to realize their own evolved characteristics, and to live an independent life free from human direction or intervention.

Conservation: Natural resources should be technically managed from a utilitarian perspective to realize the greatest good for the greatest number of people over the longest period of time.

Preservation of wildlife: Nature is an important component in supporting both the physical and spiritual life of humans. Hence the continued existence of wilderness and wildlife, undisturbed by human action is necessary.

Reform Environmentalism: Human health is linked to ecosystem conditions. To maintain a healthy human society, ecologically responsible actions are necessary. These actions can be developed and implemented through the use of natural sciences.

Environmental Health: Human health is the outcome of interactions with physical, chemical, biological and social factors in the natural environment, especially toxic substances and pollution. To ensure community health requires a livable and healthy community, with adequate social services, and elimination of exposures to toxic or polluting substances

Deep Ecology and Ecosystem: The richness and diversity of all life on earth has intrinsic value, and so human life is privileged only to the extent of satisfying vital needs. Maintenance the diversity of life on earth mandates a decrease in human impacts on the natural environment, and substantial increases in the wilderness areas of the globe.

Environmental Justice and Politics: Ecological problems occur because of the structure of society and Political will of a nation. The nature and attitude of a societal structure creates for the continued exploitation of nature.

Eco Spiritualism: Nature is God's creation, and humanity has a moral obligation to keep and tend the Creation. Hence, natural and unpolluted ecosystems and biodiversity needs to be preserved. Green: All humans and their communities deserve to live in an equitable, just and environmentally sound world. Global abuses - such as ecological destruction, poverty, war, and oppression - are linked to global capitalism and the political and economic forces that have allowed the development of social inequality and injustices.

Species diversity conservation: Species diversity conservation and Biodiversity conservation should be the focal point of a civilized society. Western Ghats and Wayanad are rich in biodiversity. Species diversity conservation means that "Conserve all living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems, and the ecological

complexes of which they are part of: this includes diversity within species, between species and of ecosystems." (Source: 1992 Convention on Biodiversity)

Climate Conservation: In an era of rapid climatic change, a different kind of conservation is needed. Climate-smart conservation is a new idea implemented by WWF and a new way of thinking about protecting our environment i.e., Climate-smart conservation is about developing and implementing solutions that are effective under a range of potential futures.Key elements of climate conservation are, Understanding the implications of climate change, including how human responses might lead to changes in other conventional threats, Developing and implementing no-regret actions that address current threats, do not erode options for responding to future climate change, and avoid contributing to greenhouse gas emissions and Taking an integrated approach to adaptation, contributing to nature conservation and fair, equitable and sustainable development.

Sustainable Tourism: In modern age tourism have a prominent role for economic development of a society. We cannot ignore the role of Tourism for bringing foreign money to our country. But normal tourism or irrational tourism projects are always standing against the eco friendly concept or sustainability. No matter which form of tourism we will see predominantly in the future, all sorts of tourism are dependent on resources, especially natural and cultural. The challenge is to manage the use of those resources in a sustainable way. World Commission on Environment and Development, 1987, suggested some norms for the Sustainable Tourism Development (STD). these are meet the needs and wants of the local host community in terms of improved living standards and quality of life; satisfy the demands of tourists and the tourism industry, and continue to attract them in order to meet the first aim; and, safeguard the environmental resource base for tourism, encompassing natural, built and cultural components, in order to achieve both of the preceding aims. When we planning to implement any policy related to the sustainable tourism, these norms has to be focused.

Green carbon Project: The concept of 'Carbon Neutral ' puts forth the notions of zero carbon development, nature conservation, food and energy self-sufficiency, economic well-being and regional development. Wayanad district, nestled in the Western Ghats on the extension of Deccan

Plateau and home to crops that are thermo-sensitive and vulnerable to climate change such as coffee, paddy and pepper,was selected for a community-based climate change adaptation initiative called "Carbon Neutral Wayanad". A pilot project was then launched at local government level on June 5, 2016. Meenangadi Grama Panchayat leadership came forward to take up the responsibility to be a model Panchayat for Wayanad district and the rest of the country. This project aiming for developing 'Sustainable Development Framework' scientifically reinforced and catering to all needs of the people by mainstreaming Climate Change Adaptation as a core element in the development plans. Carbon Neutral Meenangadi is such a innovative project with a community based climate change adaptation approach which is a model that can be replicated for the rest of the country. These type of projects are very useful for recalling the lost biodiversity of Wayanad and Western Ghats.

Conclusion

In conclusion, there are several factors described above that strongly support the argument to fight for environmental protection and create a better environment especially in Western Ghats region. People, Planet and Sustainability are the thematic motto of all modern states. All national governments are aiming for the growing needs of men without affecting the ecosystem. But contradictorily we face a serious environmental degradation and imbalanced bio diversity in all over the world. In recent decades, many environmental problems have increased as the result of human activities and unplanned management of the technological development. Therefore, a dispute between the importance of conservation and preservation of ecosystems to protect environment and the necessity to satisfy human desire by sacrificing the environment has been arising across the world. Various human activities have induced many undesirable effects to the environment which can be threatening to human health, economic, natural resources and gene pool of ecosystems such as pollutions, greenhouse effect, global warming and soil erosion. Finally democratic governments and political parties have key roles and more responsibility to protect our environment, because the above study reveals that a small human intervention on environment may lead to disappearance of entire species from the top of the earth.

REFERENCES

- 1. Daniel, R. J. R, 1997, Taxonomic Uncertainties and Conservation Assessment of the Western Ghats, Current Science, 73 (2), 169-170
- 2. Gadgil, M, 1996b, Western Ghats: A Lifescape, Journal of the Indian Institute of Sciences, 76, 495-504
- 3. Prasad, S. N. (1998). Conservation planning for the Western Ghats of Kerala: II. Assessment of habitat loss and degradation. Current Science, 75, 228–235.
- 4. Prof.madhav Gadgil(2011). Report of the Western Ghats Ecology Expert panel.
- 5. Dr. Krishna Swami Kasturirangan.(2013).Report of the WGEEP.
- 6. The World Bank (2010). The little Green Data Book.
- 7. Raveendranathan D(2016). Western Ghats and the Bounteous services showered on the planet.
- 8. Prerna Singh Bindra,(2010) The Vanishing : India's wild life crisis.
- 9. Ali Rasiya Beegam and Sibi M .Flowering Plants of the western Ghats, India volume 2.
- 10. Rao RR (1994). Bio diversity in India, Floristic Aspects.
- 11. Gaonkar H(1996) Butterflies of western Ghats, India.
- 12. Frankel Otto H(1995). Conservaation of Plant Biodiversity.
- 13. Dikshit KR(1998) Environment, Forest ecology and Man in the western Ghats.
- 14. Johny O K.Wayand Rekhakal.
- 15. Sankaran K V, Suresh TA, Sajeev TV (2013). Handbook on Invasive plants of Kerala.
- 16. Narayanan MK, Mitun Lal S.Etho botanically important trees and their uses by Kattunaika Tribe in Wayanad
- 17. Ratheesh Narayanan, Shaju T.Orchids of Wayanad.

- 18. Report, Government of Kerala. The flood plain and Ground Water Information Booklet of Wayanad District
- 19. Paddy land and wet land Act 2008, Government of Kerala.
- 20. Report of MS Swaminathan Research foundation Biodiversity of Wayanad
- 21. Report, Government Of Kerala. Soil Survey Organisation.
- 22. Khoshoo, T. N. (1995). Census of Indias biodiversity:
- 23. Krishnakumar, G., Gopalakrishna Bhat, K. and Kaveriappa, K. M. (1998). Endemic, rare and threatened plants of the Kaiga **forest** of Uttara Kannada in, Karnataka. Higher Plants of Indian Sub-continent
- 24. Rajagopal, K. and Gopalakrishna Bhat, K. (1998). Pteridophytic flora of Karnataka state, India.
- 25. Lück, Michael. (2002). Looking into the Future of Ecotourism and Sustainable Tourism. Current Issues in Tourism.