



## Issues and Challenges in Indian Forest Ecosystem – A Socio Economic and Ecological Exploration

**S Rajendran**

Professor of Economics  
The Gandhigram Rural Institute  
Gandhigram – 624302

**S Sangeetha**

Research Scholar in Biology  
Tamil Nadu

**R Sathishkumar**

Head of the Department of Economics  
AVVMSP College, Poondi, Thanjavur, Tamil Nadu

**Abstract:** India made a commitment to the United Nations Framework Convention on Climate Change to restore the green cover to 33 percent of total geographical area by 2022. It would be a Herculean task to reach the committed extent of 33 percent forest cover by end of this year because of the dependency of livestock and human population leading to increased demand for fodder, fuel wood, timber and other non-timber forest products in India. Forests are denuded for a variety of man-made reasons besides natural factors like anthropogenic pressure and forest fires.

Forest plays multiple roles to provide different interconnected benefits starting from meeting local livelihood needs; balancing the ecosystem; neutralizing the carbon stock; fulfilling cultural aspirations and to rejuvenating the living beings on the planet earth. However, there are difficulties in scientifically estimating the socio-economic and ecological benefits derived from the forest eco-system services due to methodological shortcomings.

Against this backdrop, the present paper examines issues and challenges in the dynamics of Indian forest economy with twofold objectives. This paper used only secondary source of published materials from the government documents, press reports and journal articles to substantiate the arguments and inferences here. This paper has been classified in five sections. Followed by an Introduction in section I, Macro Development in Forest Sector is discussed in section II, issues related to forest resource depletion is examined in section III, the Challenges of Forest Economy is discussed in section IV and finally Conclusion is offered in section V. Everyone is keen to have more forests to have lush green environment. Conversely forest resources are indiscriminately exploited and used. Without doubt forest becomes an integral part of the survival of all living beings. It has strong symbiotic relationship with animal and plant kingdoms to proliferate and sustain planet earth and atmosphere. Hence forest resources are to be protected, managed and used on the principle of sustainable and holistic development. This paper has made a modest attempt to highlight the macro patterns of forest cover and related issues to be addressed by the planners. Opportunities and strategies for increasing forest cover and other wildlife resources have also been outlined on work footing. Though it is a Himalayan task, it is not impossible to increase forest base eco system in the biodiversity rich India.

### I. Introduction

*“Lest we Forget, Our Constitution will remind us of the Importance of Protecting the Natural Environment and Wildlife”*

The Indian King Asoka and his daughter gave greater attention to plant

trees on the road side for the benefits of travelers and animals. Most of the dynasties in India attached greater importance for maintaining green cover not only to increase availability of food, fodder, fuel wood, fiber and fruits but also resilient to the climate induced



disasters. Even today, on many roads one finds giant diverse trees with large canopy of tamarind, rose apple, mango, jackfruit, fir and pear pal. In line with this, in the name of 'saved groves' many have been planted, protected and conserved across Indian country side. This shows the need for sustainable forest management through restoring, rejuvenating and reorienting the constitutional responsibilities of maintaining forest cover. Nonetheless, various factors leading to faster depletion of forest resources, which warrants immediate action.

The recently released India State of Forest Report (ISFR, 2021) provides many insights on the status of forest in the biodiversity rich Indian sub-continent. India houses many rare ecologically and economically important flora and fauna, is one of the major hotspots and repositories of biodiversity in the world. Forest eco-system services include economical, social, ecological and biological and as India has many sub-systems within economic classes, social settings, environment conditions and bio-resource diversity, forest resources play a crucial role in sustaining the overall development. A rough estimate shows that around 280 million people including 90 million tribals are depending on the forests for their livelihood needs. (Sharma and Choudhry, 2013).

It is surprising that wildlife crimes are increasing at an exponential rate; recently the Union Health Minister revealed in the Parliament that 601 cases were registered and 1231 accused were arrested in 2021 in India in connection with wildlife crimes. In fact wildlife related smuggling is considered as fourth lucrative business in the world. Realizing the enormity of the issue, Interpol and World Customs comprising 103 countries

joined with the Indian Ministry of Environment, Forest and Climate Change to arrest the wildlife related crimes in 2017. As part of this during September-October 2020 conducted Operation Thunder and seized 18 tones of red sanders logs, illegally stored for export.

As a public good, forest plays a variety of functions starting from rejuvenation of fauna and flora, recreation, economic and balancing the environment including neutralizing climate change. At the same time due to indiscriminate and unscientific usage, it is more often abused and becomes tragedy of commons as it's become nobody's property. Moreover market based liberalized production system and consumer driven modern lifestyle force to exploit forest resource beyond its carrying capacity.

A few empirical studies on the dynamics of Indian forests show revealing and interesting inferences. Rajendran (1992) found that strong cooperation and will power of the local communities is essential to take forward the afforestation so as to increase forest cover at village level. Taking clue from the social forestry program, sponsored by the Swedish International Development Agency (SIDA), the author suggested that sharing of benefit with the local communities make people to partner themselves in successful tree plantation activities. In the same study based on the field experience, the author suggested that fruit yielding and more shade giving tree species like tamarind, mango, jackfruit, wood apple, *pongamia* and rose apple are preferred than species like black babul and eucalyptus. Unfortunately only these trees were planted by officials as large tracts under SIDA project. The cooperation of people



can save and conserve the tree and one of the best notable examples is the Chipko Movement during mid seventies, initiated by an environmentalist through group action with the goal of saving trees in the Himalayan region.

Nevertheless, there are conflicts among local officials which jeopardize the afforestation activities. Young pregnant women forest officer was mercilessly thrashed by none other than the President of a Village Forest Management Council in Palsovade Village in Satara district of Maharashtra during the first week of January 2022. It is believed that the President expected favor from the official to extract forest resource. Alienation of local communities from forest zone is often cited as reason for not improving the forest resources. Instead of top down attitude bottom up approach is required for improving the dense forest cover.

India made a commitment to the United Nations Framework Convention on Climate Change (UNFCCC) to restore the green cover to 33 percent of total geographical area by 2022. It would be a Herculean task to reach the committed extent of 33 percent forest cover by end of this year because of the dependency of livestock and human population leading to increased demand for fodder, fuel wood, timber and other non-timber forest products<sup>1</sup> (NTFPs.) in India (Pokhriyal et al, 2013). Against this backdrop, the present paper examines the broad issues and challenges in the dynamics of Indian forest economy with twofold objectives; firstly to highlight the critical issues in confronting the sustainable forest

resources and secondly to offer workable suggestions to increase forest resource in general and forest cover in particular.

This paper used only secondary source of published materials from the government documents, press reports and journal articles to substantiate the arguments and inferences here. This paper has been classified in five sections. Followed by an Introduction in section I, Macro Development in Forest Sector is discussed in section II, issues related to forest resource depletion is examined in section III, the Challenges of Forest Economy is discussed in section IV and finally Conclusion is offered in section V.

## II. Macro Development

The ISFR (2021) revealed that Indian forest cover marginally increased at 0.3 percent in 2020 over 2019 with 12540 sq km and 721 sq km in tree cover totaling 2261 sq kms. Currently India is ranked (FAO, 2020) as the 10<sup>th</sup> largest country in the world in terms of forests area comprising 1.8 percent of the global forests. Within India, it is endowed around 24.6 percent forest accounting to 81 Million Ha that includes all types of forests to total geographical area. It is found from the IFSR that five states have the density of more than 75 percent and 12 states have the range between 33 percent and 75 percent. Forest cover is defined all land more than one Ha in extent with a tree canopy density of more than 10 percent; between more than 10 percent and 40 percent is regarded as open forest; more than 40 and less than 70 percent is classified as moderately dense forest and above 70 percent density is categorized as very dense forest. While releasing ISFR, the Union Environment and Forest Minister suggested that there is a need for qualitative improvement rather than

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<sup>1</sup>Constitutes 18 percent livestock and 17 percent population worldwide forcing to growing pressure on forest eco-systems and NTFPs.



quantity of forest cover. Table 1 shows the changes in the forest cover in India.

**Table - 1: Changes in Different Types of Forests in India (2011-2020)**

Year	VDF	% Change	MDF	% Change	Open	% Change	Total Forest Cover	% Change	Scrub	% Change
2011	83471 (2.54)	-	320736 (9.76)	-	287820 (8.75)	-	692027 (21.05)	-	692027 (21.05)	-
2013	83502 (2.54)	0	318745 (9.70)	-0.61	295651 (8.99)	2.74	697898 (21.23)	0.86	697898 (21.23)	-1.56
2015	85904 (2.61)	2.76	315374 (9.59)	-1.13	300395 (9.14)	1.67	701673 (21.34)	0.52	701673 (21.34)	0.00
2017	98158 (2.99)	14.56	308318 (9.38)	-2.19	7,08,273 (9.18)	0.44	708273 (21.54)	0.94	708273 (21.54)	11.11
2020	99779 (3.04)	0.66	306890 (9.33)	-0.64	307120 (9.34)	0.86	713789 (21.71)	0.18	713789 (21.71)	0.71

**Source:** State of Forest Reports (Various years).

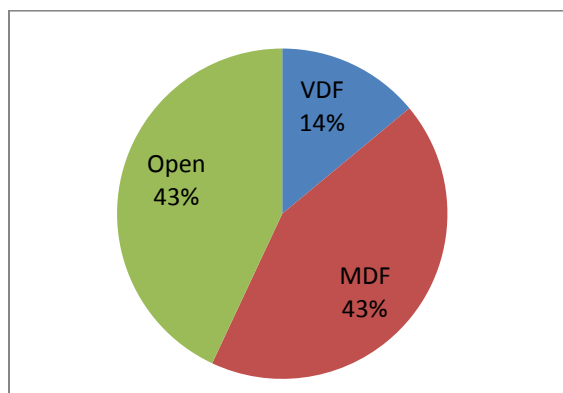
**Note :** (i) VDF- Very Dense Forest: MDF - Moderately Dense Forest, Open Forest and Scrub.

(ii) Absolute Numbers are in Sq Km and

(iii) Numbers in brackets in percentages.

The above table depicts percentage changes in the coverage of different types of forests in India. Overall forests cover have increased from 6,92,027 lakh sq km to 7,13,789 lakh sq km an increase of little more than 3 percent. VDF, Open forest and Scrubs have increased but MDF shows a declining trend from the extent of 4.32 percent. The reason for increase in forests area can be attributed to preservation and conservation strategies. Though the ISFR documents the forest cover through high resolution mapping it shows some flaws in estimates as some studies found (Valliappan, 2022 and Bhusan, 2022). In fact, tea gardens, palm groves, deserts, tea estates, *Prosopis Juliflora* plants have also been shown as forest cover. Figure 1 shows the percentage share of different forest types in India in 2020.

**Figure - 1: Percent Share of Different Types of Forest Cover in India (2020)**



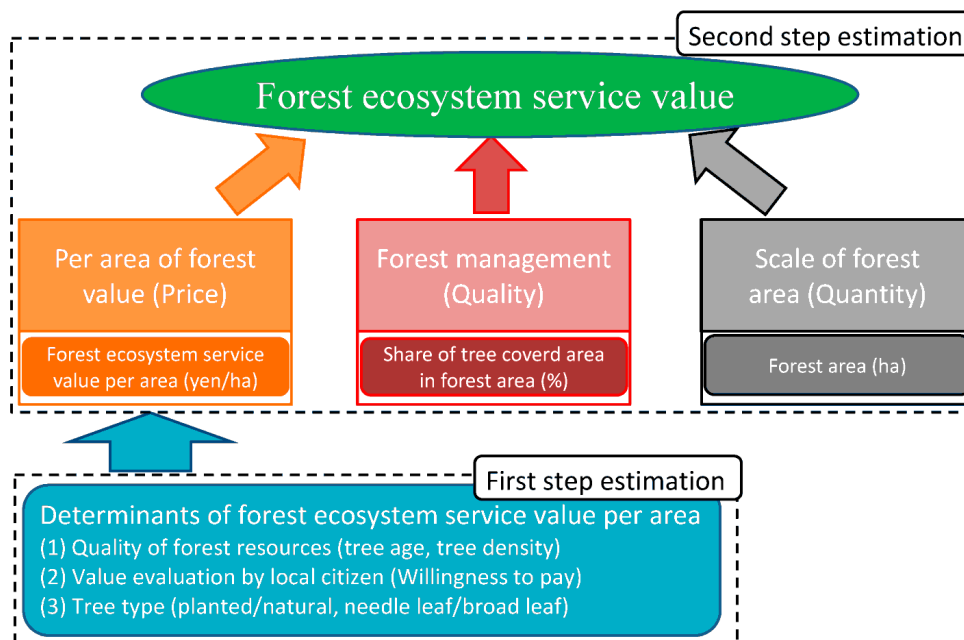
**Source:** Extracted from the Table 1.



Sustained initiatives to increase forest led an increase in forest cover in three states of Andhra Pradesh, Telangana and Odisha in 2019. Madhya Pradesh, Arunachal Pradesh, Chhattisgarh, Odisha and Maharashtra have the largest forest area in India. Further, it is observed that 17 States and Union Territories have more than 33 percent of forest to geographical area in their respective regions. In terms of forest cover to gross land area, Mizoram, Arunachal Pradesh, Meghalaya, Manipur and Nagaland states dominate their counterparts as they are traditionally endowed with rich forests. Unfortunately due to natural calamities, forest fires and denudation, the forest cover has depleted in 11 states, largely from north eastern region.

Forest plays multiple roles to provide different interconnected benefits starting from meeting local livelihood needs; balancing the ecosystem; neutralizing the carbon stock; fulfilling cultural aspirations and to rejuvenating the living beings on the planet earth. Figure 2 illustrates a broad framework for valuation of forest eco-system services. The ISFR report shows that total carbon stock is estimated to be 7204 million tones and increase of 79.4 million tons in 2019. It is proposed to achieve increasing the additional carbon sink of 2.5 to 3 billion tones CO<sub>2</sub> equivalent by 2030. However, there are difficulties in scientifically estimating the socio-economic and ecological benefits derived from the forest eco-system as observed by a few studies (for more studies see, Chaki, (2022).

**Figure -2: Forest Eco-system Services**



**Source:** USAID (2016)



The ISFR cautioned that 35 to 46 percent of forest is prone to forest fires with 2.81 percent being extremely vulnerable. Between November 2020 and June 2021 a whopping 398774 forest fires were reported across the country and for sure millions of rupees worth of resources would have been burnt. Due to illegal felling and smuggling, the Red Sanders Anti-smuggling Special Task Force in Telangana has arrested 324 accused; 177 cases of smugglers were booked and seized Rs 500 crore worth of logs in 2020-2021.

### III. On the Flip Side

While the forest survey shows that its estimate is convincing that forest cover has increased, a closer scrutiny reveals a dismal picture. During the last two decades, while the aggregate forest area has increased by 32251 sq kms; dense forests have actually reduced to the tune of 10140 sq kms and open forests have shown an increase of 48391 sq kms. This demonstrates the fact that forest cover in the degraded forest category increased but declined in the quality forest area.

Another observation (Bhusan, 2022) is that the recorded forest area is about 775288 sq kms (23.58 percent) of geographical area and however, forest cover exist only 516630 sq kms roughly two thirds of the forest areas under the government control. Another flip side is that during the last decade, forest inside the recorded forest area has declined by 14071 sq kms and surprisingly it increased by 35779 sq kms outside. It reveals an important fact that forest is expanding on private mainly for plantation and declining from forests managed by the government and bio-diverse forests show degradation. Yet another issue is that during the last two

decades, growing stock in forests declined from 4781.4 million cubic meters in 2008 to 4388.15 cubic meters (8 percent) in 2021.

Valliappan (2022) quoting comments from forest researchers that, to create an impression among the people that forest coverage is steadily increasing the ISFR actually manipulating the data to a higher side. A classic example is that Rajasthan's desert district, Jaisalmer has forest according to forest survey. Perhaps this is due a methodological flaw.

One of the most striking flip sides of the forestry in India is that of improper valuation of forest services. The contribution of forestry sector to India's GDP is only around 2 percent due to un-accounting of the intangible services. In this regard, noted Delhi based Center for Science and Environment in its (Agarwal, 1992) book 'The Price of Forests' estimated that a 20 year old tree can give Rs 1.5 lakh worth of various functions including biological services. There has been academic discussion from the individuals and research agencies to scientifically asses all the services provided by the forest eco-system. Valuation tools like natural capital accounting, green accounting in monetary terms can be incorporated in the valuation process.

In fact there was effort to develop indicators to value forests as part of the Bhopal – India (B-I) process for Sustainable Forest Management. This has been incorporated in the National Working Plan Code (NWPC), forms the basis of devising forest working plans. However, this warrants to be improved so as to suit at integrating different spatial structures (national and local levels) to



asses forest eco-system services (Malekniya, 2018). The new NPWC has incorporated a few more ecological functions (NFPWC, 2014). Even this is subjected to criticism as social benefits interrelated multiple services to different stakeholders. Hence, the forest management principles shall include social, economic and ecological functions in a holistic manner to promote sustainable forest resource base.

#### IV. Challenges in Forest Ecosystem

Forest cover has been denuded for a variety of reasons. Construction of major dams inside the dense forest, installation of hydro projects, erecting electricity transmission lines, expansion of cultivable area on the forest fringes, diversion and conversion for large forests to plantation crops, exploitation for pharmaceutical formulators (Sathishkumar, 2022), encroachments, illegal felling, development of industrial clusters, construction of housing colonies, fast expanding urban agglomerations and recreation facilities, shifting cultivation, clearing for iron ore projects, setting up of mining plants and construction for transport facilities have all contributed as manmade factors in depleting forests cover and ecosystem. Natural factors like anthropogenic pressure, landslides, invasion of alien plants (Rajendran, 1995), spread of unknown but sudden fungal diseases, parasites, pests and forest fires have on their part play spoilsport to destruct forest cover and biodiversity.

In his study, Rajendran (1995) reported that though alien plant species like *Prosopis juliflora* (*kattukaruvel* in Tamil) are disliked in general by the locals, attempts have been made to make

furniture items from the well grown trunks. Besides, used as raw material for producing charcoal and it provides employment opportunity and income support in drought prone regions in South Tamil Nadu in general and Ramanathapuram district in particular. The same researcher in his review (Rajendran, 1995a) found that another alien species, eucalyptus was forced to cultivate from officials for supplying the harvested poles to paper industry. It was widely alleged<sup>2</sup> that eucalyptus extract ground water from deep thereby water table declines making salinity and desertification.

Another major challenge and disheartening issue is that after the introduction of Liberalization, Privatization and Globalization (LPG) policies mega roads were laid and some stretches pass through inside the protected forests. One such notable one is the Golden Quadrilateral Project launched in 2001, as part of National Highways Development Project (NHDP). Except in a few pockets, many highways do not have either underpass or overpass to facilitate wild animals to freely trespass and are fallen victims to speedy vehicles. In the national highway-958 between Bangalore and Coimbatore 151 wild animals including three leopards were killed by speedy vehicles between 2012 and 2020 on the 28 kms stretch of Bannari and Kallipalayam on the ghat road<sup>3</sup>.

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<sup>2</sup> Personal interaction with researchers at the Soil Salinity Research Institute, Karnal, Haryana during 1993-1994.

<sup>3</sup> After hearing a petition on this issue, the Madras High Court directed the officials to explore the possibilities for imposing night curfew for the movements of vehicles.



All these adversely impact landslide, extinction of rare and high economic value flora and fauna, soil erosion, relocation of local communities, diversion of springs, water bodies, increase in temperature, climate resilience and structural change in the eco-system are taking place. Knowing fully well about these, just to fulfill the unlimited aspirations of humans, unviable and unsustainable practices are put in place in unscrupulously harnessing and unscientifically utilizing forests in the greedy development agenda. Both abiotic and biotic factors in many ways contribute for the destruction of forest eco-system.

The high powered commissions headed by Madhav Gadgil (2011) and succeeded by K Kasthurirangan (2012) warned that indiscriminate development works in the Western Ghats regions will make the situation catastrophic. But the ground reality is that denudation of forests for mining activity continues unabated and even the much hyped and celebrated 'Sacred Groves' are under threat. A recent article (Sharma, 2022) on 'saved groves' from Jharkhand shows convergence as well as divergence among different interest groups such as communities organizations, governments and panchayat raj institutions (PRIs) are involved in managing the forest eco-systems.

During the construction of hydro-electric project in the Himalaya's Garwal ranges in Chamoli district in the highly fragile Uttarakhand landslide caused not only damage to property but also more than 100 people lost their lives. Frequent forest fires in Nagarhole National Park near Mysuru in Karnataka have been affecting the tiger reserve. Sirumalai and Kodaikanal forest ranges on the Western

Ghats range in Tamil Nadu meet with forest fires every year thereby ravaging flora and fauna.

Increasing urban forest cover is also equally important on many counts including reducing air and dust pollution. The Miyawaki technique (high value fruit yielding and shade giving saplings) is more ideal to grown diverse plants more dense. This has been successfully taken by development organizations with the support of local PRIs. Parks, roadsides, river beds, embankment of water bodies, *poramboke* lands may be used for planting saplings to increase urban forest cover. In fact this has proved island forests in some of the municipal corporation areas. For instance, using Miyawaki technique, urban forest cover increased by 5 sq kms between 2011 and 2021 in the Greater Chennai Corporation areas. Wherever possible, the urban households may be encouraged to take up planting saplings. Even in semi-urban and fast growing villages tiny plantations with local species may be taken up.

More often, local aboriginals are blamed by the authorities for the denudation of forests. Our field experiences in the Kolam tribe dominated Madhya Pradesh and Jenu Kuruba settled in Karnataka show that local communities want to protect the forest resources for their very sustenance. Recently a notorious tree smuggler was dragged<sup>4</sup> out from his house and thrashed by the fellow villagers for preventing him from regularly illegally felling valuable trees in Uttarakhand – a fitting lesson to

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<sup>4</sup> It is reported that despite the warnings given by the local villagers, smuggler continued the illegal felling of tress and angered with this they resorted the brutal action.





the forest offender. Another touching narration is that some 25 years ago a popular Hindi actor poached a deer in Rajasthan forest and he was remanded and put behind bars. Recently during December 2021 the local youths volunteered to construct a memorial in the village where the deer was hunt to demonstrate the need for conserving wildlife resource. But contrary to this gesture, the local tree smugglers regularly<sup>5</sup> connive with the youths for more wages to fell and smuggle rare plants like red sanders on the border areas of Andhra Pradesh, Karnataka and Tamil Nadu for exporting to East Asian Countries. The Forest Protection Act 2017 provides exemption to local communities to collect NTMFPs like broom sticks, gooseberry, soap nut and so on. But seizing this opportunity the local smugglers lure the tribal youths to illegally cut and export economic value trees and also poach wild animals.

During the third week of January 2022, the National Green Tribunal (NGT), Chennai Chapter slapped a fine of Rs 75 lakhs as compensation to the state run Tamil Nadu Government Energy Development Corporation (TANGEDCO) held responsible for the deaths wild animals, which came in contact with high voltage wires inside reserve forests in Cherambadi village of The Nilgiris Bio Reserve Zone during February 2020. The amount as per the advice of the NGT is to be used for implementing measures needed to avoid man-animal conflict and it also directed the TANGEDCO to lay underground supply lines.

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<sup>5</sup> During 2018 around 60 illegal wood cutters from Tamil Nadu were shot dead inside the sandalwood grown reserve forests in Andhra Pradesh and made acrimony among political circles between two states.

Also some of the leading pharmaceutical companies are over exploiting the plants without proper reporting and accounting and failing to comply for paying user charges<sup>6</sup>. Though the country has established the National Biodiversity Authority (NBA), it could not streamline the use of forest resources and collecting user fees from the Multi-National Companies (MNCs) for benefit sharing. Sathishkumar (2022) reported that in Tamil Nadu of 650 MNCs only 10 per cent submitted the details. Even the public sector undertakings like National Mineral Development Corporation, are more interested in exploiting the minerals at the cost of forest resource.

Recently the Government of India has allocated Rs 11040 crore to take up palmyra cultivation on 6.5 lakh Ha largely in north eastern states, where dense forests are more. This is to increase production of edible oil. Nevertheless, it is alleged and feared that this will result in denudation of thick forests and would cause landslides and loss in biodiversity. Also it is believed that forest will be leased out to MNCs to establish palmyra plantation. Fear has aired that local tribals will be losing their land title deed (Rajendran and Sabarisakthi, 2021) besides affecting eco-system. Already thick forests were completely cleared for planting tea and coffee plants in Valparai hills in Western Ghats section of Tamil Nadu. In the recent survey this area has been illustrated as forests<sup>7</sup>.

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<sup>6</sup> The Biodiversity Act 2012 enables the NBA to collect from 3 to 5 percent on products and from 1 to 3 percent on trade as benefit sharing with the local communities.

<sup>7</sup> More strikingly, the neighboring Union government buildings of the under construction new parliament complex in Delhi is shown as forest.



Certainly, denudation of forests will have severe adverse impact on the community in the form of man-animal conflict and on the other species like leopards, monkeys and snakes enter into habitation in search of food. Uprooting trees for laying roads around Triuchirappalli municipality forced monkeys to raid urban (Rajendran, 2022) residences in search of food and sometimes took away children. Clearing forests for other purposes and encroachments increase the man-animal conflict and unless sufficient space is available for wild animals such untoward incidents will severely compound the problems in coming years.

On the policy domain, there are challenges, which need to be tackled based on intensive consultation with all local stakeholders. Recently, the Union Ministry of Environment and Forests has invited comments on the proposal for rating the states on speedy processing and approval of clearance inside forest regions for development projects. Many environmentalists and some administrators are apprehensive of this as proposals will be cleared without considering the adverse implications thread bread at local level. They commented that proposals will be approved by sitting in air conditioned rooms. Such framework will jeopardize the basic rights of local communities and it will alienate the forest dwellers. Moreover, in many cases, consultation with local communities, farmers and other stakeholders by the officials is merely completing the formality. Sometimes such important meetings are hurriedly arranged in a fast track mode and short notice without supplying all relevant documents and reports. More often these documents and reports are

flooded with jargons in English and the locals may not know anything about them at all. This has created flutter in some project regions in Odhisa, Tamil Nadu and Chhattisgarh.

A recent paper on comprehensive monitoring framework on forests (Chaki et al, 2022) noted that the framework of forest monitoring in India has attracted more importance to ecological dimensions. It commented that the important issues from economic and social aspects have been sidetracked. Therefore, it is suggested for a comprehensive framework from a multinational methodology to unfold the full potential of the Indian forest sector. However, it not an easy task to develop an indicator to assess the eco-system. There are many pull to push factors that come in the way of developing scientific framework which needs carefully devised scientific models.

Proposals like upward revision on net present value (NPV) of forest to be paid by the project developers are welcome move, but some are not convinced. The union government proposed to hike the proposal fee ten times of NPV in national parks and five times more in sanctuaries to use them for development projects. It is alleged that mere upward revision (Sharma Richa, 2022) of NPV rates is neither a deterrent against forest diversion, nor does it ensure that the bonafide forest rights lost in the process of permitting for non-forest use have been duly compensated.

The IFSR 2019 also states that there has been a marginal increase of 17 sq km to reach 4992 sq km on the mangrove forests area in the country. The highest growth of 37 sq kms mangrove forest cover was reported in



Gujarat coastal zones. During tsunami in 2004 mangroves provided as shields to east coast areas in Cuddalore, Nagappattinam and Ramanathapuram district. Surprisingly wherever the mangroves are thick the damage was much less. Therefore, effort shall be made to increase the mangrove forests. Realizing the economic and ecological significance of mangrove forests, NGOs like Odisha Paryawaran Sanrakshan Abhiyan has been planting native mangrove plants such as Rai, Harakancha, Sundari, Bani Guan and Keruan on 18 kms stretch on the Astaranga beach in Puri district.

Sometimes due to lack of proper planning and legal direction, wildlife resources are neglected and sometimes looted. A recent report in the media from the drought prone semi-arid Ramantapuram district in southern Tamil Nadu revealed that during 2021 alone 26 deer and 10 peacocks have been killed for unknown reasons. In fact, this district has five birds' sanctuaries and attracts large scale migratory birds from far off places. A large herd of deer and other wild species are found all along the shrub forests on the embankments of irrigation tanks<sup>8</sup> locally known as *kanmois*. Unfortunately there has been no official enumeration on the number of wildlife animals in the district. Some unscrupulous hunters poach deer and peacocks for meat and the offenders were not brought under book.

On its part the prolonged covid19 lockdown has resulted in increasing the crime in wildlife sector. Sathishkumar and Rajan (2021) reported that owing to

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<sup>8</sup>This district has a number of irrigation tanks and serve as shelters to wild animals in Tamil Nadu.

lack of effective police patrol in the forest fringes, the youth including school children poached the scheduled animals like monitor and rabbits to cook the meat and enjoyed as social feast. Despite shortage of sufficient manpower the forest department in Tamil Nadu, collected more than Rs 42 lakhs as fines from the offenders.

## V. Way Forward

In all schools and colleges, the students shall be oriented towards the promotion, and conservation of forest resources. In many colleges, afforestation programs have been taken up but follow up action is missing. Wherever possible the students-folk should be made as warriors in the eco-system management. Organizing awareness through eco-tourism will instill interest, confidence and more responsibility in conservation of forest resources.

Mass afforestation and tiny plantation shall be taken up on all CPRs and in the educational and industrial campuses. Preference shall be accorded to native plants which are highly suitable for local environment. The forest research organizations including Indian Institute of Forest Management should develop plant species which have resistance to pests and droughts. On the coastal areas, as second line next to mangroves, palmyra, cashew and casuarinas plantations to be taken up to prevent sand dunes and high rising tides. Strip plantation is to be initiated on all roadsides, rail lines and embankments of water bodies. Local communities, officials from all wings, development organizations, PRIs and farmers shall join hands not only to promote forest base but also to share the benefits more judiciously. Different afforestation



programs like social forestry, agro-forestry, protected forests, plantations, watershed management and concerned research in association with extension agencies shall extend all possible helps to increase forest cover and resource base for promoting sustainable forest management system in India.

If no concrete and workable action is taken to increase the forest cover to 33 percent, it would be extremely difficult to sustain living beings on the earth. The Earth Summit gave a blueprint to take forward the agenda for sustainable development. Increasing forest cover, sustaining the same is a Herculean task as it involves strong commitment and determination by all stakeholders including the Union government, States, local communities, farmers, NGOs and MNCs. Collective action must be the mantra to instill confidence among local communities to engage in increasing forest cover.

The flagship MGNREG Programme, beneficiaries can be effectively utilized for undertaking planting sapping in all the villages across the country. The same workers can be entrusted to monitor and water the plants to increase its survival rate. If it is effectively done on democratic principles taking the confidence of the Panchayat Raj Institutions, within 5 years the Indian country side where the common property resources are available in plenty can be converted into lush green pastures. Under the Corporate Social Responsibility (CSR), the National Highway Authority of India, the corporate bodies and other agencies which are utilizing the common property resources shall strictly adhere to take up afforestation in their respective area.

Failing of which, the authorities shall impose heavy penalty on the offenders.

Often it is discussed that the present forest administrative set up and management practices and policies<sup>9</sup> were devised by the age old British raj to exploit forest resources for personal gains. Hence the focus should be towards more on rejuvenation and increasing the forest cover with the active support and help of local forest dependent communities. The forest department shall be assigned the task of facilitating the forest dwellers to manage the forest resource. In fact across the world this paradigm shift has yielded convincing results. An estimate shows that about 500 million Ha of forest in the world are some form of community control, a model to be replicated for effective and sustainable forest resource management in India.

Scientific approach shall be developed to environment and document the forest and wild life resources for effective planning and monitoring for sustainable eco-system services. Details on this are to be shared with researchers, planners and activists for a transparent governance system and careful planning. There are individuals who attained fame by planting and nurturing fir trees as strip plantation in Karnataka. There were bestowed with prestigious awards by the Governments and internationally renowned agencies. Benefit sharing in the plantation may be advocated to encourage village level communities in

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<sup>9</sup> Indian forest policies do have a long history as the first policy statement was released in 1895. Since then there has been a number of commissions and committees, which offered various measures for the management of forest resource (Mukerji, 2022).



line with the effort made by the SIDA through the Social Forestry Program in India.

The offenders shall be punished with maximum punishment. Forest officials shall be provided with advanced modern gadgets to effectively monitor the smugglers. It is found that more member of posts in vacant in the forest department and all vacant posts shall be recruited. Additionally the officials may train the rural youths particularly tribals to protect the forest resources. It is surprising that none of the major political parties in India makes a reference in the respective election manifesto to protect and optimally use the forest eco-system services. This clearly shows their insensitiveness to a major issue for very survival of living beings on the planet.

## VI. Conclusion

Everyone is keen to have more forests to have lush green environment. Conversely forest resources are indiscriminately exploited and used. Without doubt forest becomes an integral part of the survival of all living beings. It has strong symbiotic relationship with animal and plant kingdoms to proliferate and sustain planet earth and atmosphere. Hence forest resources are to be protected, managed and used on the principle of sustainable and holistic development. This paper has made a modest attempt to highlight the macro patterns of forest cover and related issues to be addressed by the planners. Opportunities and strategies for increasing forest cover and other wildlife resources have also been outlined on work footing. Though it is a Himalayan task, it is not impossible to increase forest base eco system in the biodiversity rich India.

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