UNIT 3 FORESTS AND NATURAL RESOURCE MANAGEMENT

Structure

3.0 Introduction

3.1 Objectives

3.2 Nature and Type of Forests

3.3 The Forestry Debate

3.4 Community Forests

3.5 The Pacific Mangroves and Capitalist Encroachment

3.6 Forest Narratives and their Critique

3.7 Conservation and Sustainability

3.8 Let Us Sum Up

3.9 Key Words

3.10 References and Suggested Further Readings

3.11 Key to Check Your Progress

3.0 INTRODUCTION

Forests have been recognized as of extraordinary environmental significance. They maintain essential biodiversity, act as a carbon sink for carbon emission caused by burning of fossil fuels, and provide human groups and a variety of living organisms with an ecological niche, providing a huge repertoire of resources for various human uses. They support several modes of subsistence practiced by humans such as hunting and food gathering, pastoralism and shifting cultivation as well as providing resources for settled agriculturalists.

The urban way of life however has looked upon the forest as an antithesis of itself and high urban civilizations have sometimes equated the forest with danger and negative qualities. It was for this reason that large tracts of virgin forests have been clear felled in the course of human history, to make way for settled and controlled agriculture and urban dwellings. In the first phase of human settlements the forest was looked upon as an enemy rather than as a friend and it was especially true in the period of colonial expansion when terms such as conquest and frontiers were used to designate human clearing of the forests and expansion of man -made environments. Wild animals and naturally growing species, fell victim to such an attitude and today we are facing a world where biodiversity is becoming a precious commodity and species are disappearing at a fast rate along with primary forests.

3.1 OBJECTIVES

After reading this unit, you will be able to:

- describe the nature, types and functions of the forests;

- explain the existing forest policies and the role of the state in conserving forests; and
- identify the causes of encroachment of forests.

3.2 NATURE AND TYPE OF FORESTS

The most precious forest is what is called old growth forests or primary forests, like the Silent Valley on the western coast of India. What official statistics passes off for forested land often includes plantations or commercial forestry like a clump of eucalyptus that has little environmental value. Natural Secondary growth forests that come up on fallow land in shifting cultivation also has its value, as it contains natural biodiversity. Primary forests have evolved a long term ecosystem that shelters numerous forms of life and plays critical role in maintaining biodiversity. Rangarajan (2000) mentions that the extent of forests in the northern parts of India was very vast and even in the seventh century, Hieun-Tsang, mentions vast tracts of forest while travelling India. What is interesting to note is that even at that time there were state rights over the forest and tracts of forest were like conserved forests that protected the elephant, one of the most critical wild animals required by mobility for transport and warfare. *Hasti-vanas* have been mentioned in the Arthasastra, where rulers of the Mauryan Empire had imposed rules for elephant protection, and even the tusks of an animal dying a natural death were to be handed over to the king. Then as now, the forest dwellers were regarded with suspicion and the central state was often antagonistic to them. The fauna that is mentioned in the old texts such as lions, tiger, elephants and rhinos makes it clear that the forest cover must have been very dense, to have contained all these species.

Yet from the early centuries during the spread of the empires, the forest was being constantly brought under the control of humans, and as early as the Mahabharata we have stories about the burning of the forest (Khanadava) by Krishna and Arjuna with the help of Agni (God of fire) to create more urban centers. Historically the Mauryas and the Kushanas in the north and the Chalukyas and the Sangam Cholas in the peninsular India were spreading their agricultural base at the expense of the forest, although some forest creatures like elephants were being protected for state use. The surplus allowed the state to consolidate its power and also engage in widespread trade. However royal antagonism to forests may have been countered by the lower castes and tribes who depended more closely on the forest for their livelihood and who may have had more sentimental attachment to the forest. The rise of Jainism and Buddhism in India must have contributed to the conservation of forest resources, because they forbade the killing of any form of life. As pointed out by Dr. B.R. Ambedkar, the initial followers of Buddhism could have been composed of larger numbers of lower caste people and tribes. Gadgil and Guha (1992: 89) pointed out that the proportion of vegetarians in India is significantly higher in the drier and less productive regions that must have suffered more deforestation earlier than other regions and where animal power is critical to agriculture.

A kind of forest called as Sacred Groves have played a critical role in many parts of India where they have not only preserved biodiversity but also saved water bodies for local use. But misguided notions of scientific forestry have led to their removal by the forest departments themselves in spite of strong local protests.

Gadgil and Guha(1995: 91) have recorded how the forest department was bent upon clear felling a beautifully preserved sacred grove in the village Gani in Western Maharashtra. The desperate people, called upon these scholars for help and with some difficulty they were able to prevent the felling of this grove that was also the source of one of the main water streams supplying water to this region. The forest department could not understand the logic of saving commercially valuable mature timber which in their opinion should have been replaced by new trees.

The ecological value of mature forests is immense but was not recognized till recently and even now the forest departments are more interested in commercial forestry than the rich biodiversity of mature and primary forests. On the Delhi ridge for example the forestry officials have systematically destroyed what was once a primary forest with a huge diversity of flora and fauna with artificial parks and gardens planting cultivated flowers and trees, that has now managed to destroy the habitat of most of the wild animals that once had a home there. The rich undergrowths have been cleared to plant domestic plants of ornamental value like crotons.

The Himalayan region for example has had a rich variety of forests that is found on high altitudess Guha(1989:36) gives the following classification of forests in the Himalayas.

Table 3.1: Distribution of vegetation by altitude in the Himalayas

Altitude(in feet)	**Characteristic Vegetation**
13,000	Vegetation entirely ceases
12,000	Birch and blue Pine
11,000	Fir, spruce, yew, cypress and bush
10,000	Rhododendron and chestnut limit; grassy slopes begin
9,000	Higher level oaks(*tilonj* and *kharsu*)
8,000	*Banj* oak limit
7,000	Blue and Chir pine limit; *Banj* oak and Rhododendron in abundance
6,000	Deodar begins; *Banj* and Rhododendron gives way to pine
5,000	Chir pine in abundance
4,000	*Sal* limit; *haldu* and *tun*

(**Source:** Adopted from S.D. Pant , *Social Economy of the Himalayas*, 1935, London)

According to Guha(ibid) a stable forest cover is achieved by a succession of stages. In the initial stage small plants with light seeds come up on the newly exposed ground, in the transitional stage some changes begin to occur on this ground already covered with some kind of vegetation, in the third or climax stage hygrophilous vegetation appears and forms a thick cover. In the Himalayas it is believed that in pristine times there was a thick cover of mixed forests given the favourable climatic conditions, today the conifers represent stage 2 and the oaks represent stage 3 of forest growth.

In the local economy the broad leaved varieties have more importance as they provide fuels, fodder and manure for local agriculture and for the animals. Thus the villagers preferred a natural forest of thick cover. But since the conifers have more commercial value and can be grown for export, after scientific forestry was introduced, the stage 2 to 3 growth was reversed by human intervention and broad leaved varieties were replaced by conifers. Such reversal of natural succession may have negative environmental effects and this is what happened in Uttarakhand that is now facing excessive deforestation.

3.3 THE FORESTRY DEBATE

The Forest department in India was set up in 1864 and has been a powerful controller of precious biomass reserves of this country. In 1878, the Forestry Act was revised and all rights were vested in the state (as the right of conquest of the colonial state). Thus the notion of reserved forests was introduced where large tracts of forests were closed to local people and exploited commercially for use by the state. The so-called scientific forestry implemented by the colonial administration and adopted by the Indian government has contributed to deforestation of primary forests. Recent news (16th July 2010) has reported the closure of most dams operating in the Himalayan region because of heavy siltation caused by heavy flow of soil from deforested slopes of the Himalayas. The various interest groups in India have had differential voice in the attitude and practice towards forests. The predominant voices in the earlier periods were of the imperial state, followed by the voice of scientific forestry during the colonial and post colonial period when the Indian state too looked upon the forests as a vast source of commercial resources. However new voices have come up more recently especially from the educated elite classes which can be called as pure bio-centric conservationists, who want nature to be preserved as pristine and consider all forms of human residence inside the forests as encroachment. These are the ones most influenced by western ideas of national parks and biosphere reserves. What they forget is that forest dwelling tribes and some peasants and pastoral communities have had century's old relationship with the forest and many of their practices have evolved in ways that serve to preserve the forest and the flora and fauna.

No doubt with deforestation caused by commercial exploitation and also extensive damage to forests caused by mining, dam building and industrialization, some of the practices of the forest dwellers may appear to be threatening the depleted resource. But since the population of these forest dwellers is considerably less than the urban populations whose constant demand for more resources has put the pressures on the forests in the first place, there needs to be a more balanced view on the forest and forest dweller's relationships. The recently introduced Tribal Bill has taken into account some of the issues. Yet the political and economically powerful voices are still stronger on the ground. The voices raised against illegal mining for example are quickly silenced and although the Prime Minister himself has taken up the task of Project Tiger, the tiger habitat is constantly under threat from unscheduled development projects, rampant corruption and political pressure to push through projects that have negative impact on the forests.

3.4 COMMUNITY FORESTS

The rural and tribal people with the least voice had been the most marginalized in forest related debates. Yet collective action on the ground along with dedicated work by some social workers have led to some degree of success in letting people have some say in forest management, in their own vicinity. Orissa being one such state where the concept of Joint Forest Management (JFM) was introduced but it was unacceptable to the village communities because the formal proposal of the state was not in consonance with the people's perception of forest management (Singh 2004). The alternate system evolved on the ground was Community Forest Management (CFM). At present about 8000 villages in Orissa have CFM and some have JFM that is a more formalized system. The procedure adopted in the initial stages to restore a degraded forest cover is by restricting local access to bare necessity and completely cordoning off the forest from outsiders. The villagers evolved systems of fines for local infringement and began patrolling for keeping off outsiders. Although there is a formal system of patrolling called *thengapalli,* as we have seen in the case of the Chipko movement, women who spend a large amount of time in the forest, were efficient enough to patrol the forest and raise an alarm if they saw anything amiss. Thus while patrolling by men many be considered a formal task such regular vigilance by women spending long hours in the forest to collect minor forest produce is part of their daily routine.

However as soon as the forests begin to regenerate, the community has a surplus that may be given on lease through auctions. In such a case the men who form village committees, advised by the patriarchal forest department, lease out forests near the village, thus denying women access to their own forests forcing them to travel long distances for their household requirements. It also adversely affects poor households some of whom depend upon the forest for a livelihood. The role of women in gathering forest produce is primary. It has been estimated that more than 350,000 tonnes of *kendu* leaves are harvested in Orissa by 600,000 women and children (Vasundhara 1998). Yet they are kept out of all policy making and have no rights over the forest. The Non-Timber Forest Produce (NTFP) policies of Orissa are totally dominated by the state that has monopolized all rights over the forests. Although according to JFM, 100 per cent of intermediate products and 50 percent of any major harvest is supposed to go to the Vana Samraksha Samiti(VSS) (Forest Protection Committee) yet in Orissa, the members of the VSS get salaries for collection that are given on the minimum wage rate and not based on value of collection. Thus even in the name of JFM the local people have been reduced to mere wage labour at the bottom of the scale. Singh (2004) suggests the following measures to give more autonomy to the local people especially women

a) Setting up of mechanisms for a minimum support price for NTFP items similar to those for agricultural commodities;

b) Building people's institutions/cooperatives for value addition and marketing.

However on the ground there has been little attempt to actually address the problems of the people who actually depend for their livelihood on the NTFP. The result of such alienation is that people who had the maximum stakes in preserving and caring for the forest are gradually marginalized from it. Since

they draw minimal benefit from it they may take to poaching or illegal means to supplement their income. The cognitive dimension of 'Our forest' is essential to imbibe a sense of responsibility in the local people. Even when NGOs or other agencies are involved the really poor and those who need help the most get left out of the decision making processes as they do not have networking skills and are usually not literate. Even in JFM, many local people have vehemently opposed the leasing out of rights to outsiders for money as the marginal people in the village lose their rights of user over the forests and only an elite section takes all the advantage. Women are especially against leasing out of forest produce rights to outsiders.

A suggestion made by Singh (2004:322) is that of Trusteeship Rights. She suggests that "a village community could manage forests as 'trustee' on behalf of the various stakeholders /users, ensuring that the interests of various users/dependent sections of the people are protected." She invokes age old principles of forest dwellers which have been recognized as rights of users as against rights of possession. The scholars working on hunting food gathering people (discussed in earlier units) have no notion of property but of generalized reciprocity where the people are expected to use resources in an ethical manner based upon their needs and not because of profit making motivations.

Check Your Progress 1

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) Describe the various types of vegetation found on the Himalayas and describe the impact of commercial forestry on the Himalayan ecosystem.

.....

.....

.....

.....

.....

.....

.....

2) What are the debates regarding forests? Critically discuss.

.....

.....

.....

.....

.....

.....

.....

3.5 THE PACIFIC MANGROVES AND CAPITALIST ENCROACHMENT

Mangrove forests are extremely important as a repository of biodiversity and also for performing various ecological and economic functions. Escobar (2008: 85) describes the mangroves in the Pacific area, where they play a very important role in the life of the locals. They maintain and reproduce river and ocean life and recycle huge amounts of nutrients and maintain water quality. They also house a large number of fish and fauna like molluscs and fish and crustaceans; they play a crucial role in maintaining biodiversity as they are essential for the early reproductive stage of many species. For example the shrimps lay eggs on the open seas near coastal areas, but the larvae slowly move to the mangroves, where they grow considerably before returning to sea. Mangroves offer protection to coastal areas from storms flooding and also prevent erosion. It is believed that the damage caused by the Tsunami was considerably magnified because of the removal of mangrove forests from the coasts of Indonesia and India. The local people on the Pacific coast get a number of resources from these mangroves, including timber for house building, fish and molluscs to supplement their diet and tannin for dying handicrafts and wood for charcoal production, fruits and medicinal plants. The estuaries that feed the mangroves also provide transportation, thus the influence of these mangroves goes beyond the immediate environment and has far reaching effects. However ever since fish trawlers have become popular from around 1980s they have been damaging the ocean ecosystem. The diminishing returns of naturally occurring shrimp have led to the popularization of aquaculture and the World Bank has been enthusiastically funding such projects all across the world. The immediate fall out of aquaculture is the destruction of mangrove forests. The fish ponds are being created after uprooting mangrove forests and most of contemporary shrimp comes from ponds rather than the sea.

Eucador is one of the world's leading producers of shrimp by farming. However recently there is a ban on shrimp farming and new ponds are created due to mangrove forest destruction.This is causing more and more community opposition. Here we have one more case of local communities in opposition to their resources being used for commercial purposes even though shrimp industry is a highly lucrative industry with the great demand from Europe, Japan and USA. However the alarming destruction of mangrove forests, about 2,600 hectares in Nariño, alone by the mid-1990s has led to large scale protests against their destruction. One solution has been to shift shrimp farming to inland zones of higher elevation. Efforts are also underway to restore mangrove forests although it takes a lot of resources to do that, about $5,250 to $125,000 per hectare (Escobar: 89).

An important dimension of identity of communities has been realized in the eighties and nineties that has led to many movements to preserve or restore traditional forest and land based ways of life to the peasants and to reduce commercialization of all resources. Significant advances in this direction has been achieved in the pacific region as described by Arturo Escobar, who writes, "The idea that 'the territory' was fundamental to the physical and cultural survival of communities, and the argument that these communities have unique ways, rooted in culture, of using the diverse spaces constituted by forest, river, mangrove, hills, and ocean were the two most important conceptual innovations". (2009:

54) The implications of this for all other regions are significant. It puts a question mark on the ethics of displacement and also uprooting from traditional ways of life that is routinely being practiced in Third world countries such as India. The relationship of forests and forest dwellers also becomes far more significant as we understand that for those who live in the forest, it is not just a place to get subsistence but an identity, a way of life and the notion of empty space has been converted to one of landscape.

3.6 FOREST NARRATIVES AND THEIR CRITIQUE

The generally prevalent narratives about forests especially those built up by outsiders is that forests everywhere are getting degraded and the forest dwellers are responsible for degradation. It is this narrative that has led to all kinds of policy formulations that focus upon removing people from forests and creating nature reserves that totally exclude human beings. But some of these narratives have been proven to be wrong as people practicing traditional subsistence had developed a balanced relationship with the environment. One example is that of cattle grazers in the Bharatpur sanctuary, where the removal of cattle grazers led to thick growth of grass that choked the area and prevented the birds from finding a place to land and thus considerably reduced bird presence in the sanctuary.

Let us now take a case study from West Africa reported by James Fairhead and Melissa Leach. Kissidougo, is a region of West Africa that at the first look seems to be a landscape of patchy forests that surround the village settlements and a largely savannah area. The presumption of most scholars who studied that area was that earlier the entire region must have been a dense forest but human settlements and increasing populations gradually destroyed the forest and the people only kept patches of forests near their villages to safeguard the settlements from wind and to have a supply of resources for their own use. The famous French botanist Auguste Chevalier was of the opinion that the present settlers were a savannah people who had displaced the earlier forest dwellers and had converted most of the forested areas into savannah by fire setting and cultivation, converting most of it into secondary forests; retaining the dense forests only near their settlements and waterways. Similar narratives have been constructed for the forest dwellers and shifting cultivators in most part of the world and colonial and post colonial policy makers have usually taken several steps to curb what they considered unsustainable practices.

In West Africa the policy makers put restrictions on upland farming as against swamp farming. Whatever upland areas to be cultivated were to be done through scientific forestry namely agro-forestry and reorganization of tenure and fallow systems. A second set of policies have tried to impose prohibitions and regulations on bush fires (as practiced by shifting cultivators) and thirdly they have tried to create patches of protected forest where old trees typical of the region and commercially valuable are to be preserved and to restore forest cover by tree plantations by cultivating saplings in nurseries (Fairhead and Leach 2008: 106). However a critical examination of actual data has shown that the typical narrative may be sometimes quite wrong. For Kissidougo, there are available aerial photographs over the years that show the state of vegetation in that period. Surprisingly the comparison with later views does not show vegetation loss but

an actual increase in forest cover. Even earlier data from French military occupation during the 1890s to 1910 and oral recall from local people show that there has been no forest degradation from that time onwards. The elders of the villages claim on the contrary that it is the people who planted the forests near their villages and it is their work that has produced secondary forests in the savannah. Rather than a forested area being converted to savannah, the human settlements had forested the savannah and created the dense forests that have been steadily growing over the years. The practices engaged in by the villagers to enrich forested areas have been thatch and fence grass collection and tethering of cattle that reduces flammable grasses, the disposition of household wastes to serve as fertilizers for thicker growth of vegetation, planting forest initiating trees and allowing them to go into the climax stage of forest development. Such practices can be used by any human settlement to increase the forest cover around them, and human populations need not always be detrimental to forest growth. It was also seen that these practices created conditions that upgraded soil conditions to forest supporting rather than savannah. These practices included gardening and cultivation, short term fallow improvement through intensive cattle grazing and seed source protection and distributing forest inducing creepers.

Unlike again what is commonly presupposed that there are organizational or community level practices that lead to sustainability, here it was found that it was the short term production patterns like mostly carried out by individuals and families for themselves or one's own compound that had a cumulative effect by joining in with other such efforts to create a vast and effective spread of sustainable practices. For example the small fires set up in the early and mid dry season prevent larger fires from spreading. There has been no overhead organizational structure to manage resources and it is because of these individual initiatives that the local people have been able to adjust to flexible economic and ecological conditions.

The forest islands have served various purposes historically serving as fortresses when wars were common in the pre-colonial periods. Later they grew coffee on the outskirts of the forests, when it was profitable to do so and later turn to growing fruit trees. Employment opportunities and out migrations have reduced farm sizes but they are managed in a way that sustain the fallow and forest cover and women do farming in ways that is continuously improving soil conditions and encouraging vegetation growth.

The most interesting facts put forward by Fairhead and Leach is that unlike a stereotypical assumption that more population means more deforestation, since in this place it is the people who have converted the savannah to forested land, the more people actually means more forest. Thus it is not necessary that all human initiated work on the environment is harmful and especially by a community that is not using overtly "scientific" technology. The perspective discussed here can be called *landscape-enrichment –through –use*. That is one where a people have been consciously working on their environment to make it more sustainable and ecologically improved. As Fairhead and Leach put it, "The implementation of repressive environmental policies has in effect taxed rural populations for supposedly harmful activities which were, in fact, benign or beneficial". (2008:109). Thus a population can have its own integrated vegetation management practices that can work towards enhancing forest cover and restoring environmental balances and biodiversity. Rather than imposing external policies

that may or may not integrate with local practices, it is better to create an enabling environment in which people can successfully work out their existing practices. This kind of policy will go far towards sustainability than one that blindly imposes an external model that is often based on a faulty narrative. In a densely populated country like India, it is better to look for those practices that the people have that could be effectively used to maintain and enrich the environment. By this the problems of finding more land and jobs for dislocated populations will be less and the pressure on resources would decrease.

3.7 CONSERVATION AND SUSTAINABILITY

The concept of territory and biodiversity has been integrated with that of sustainability and conservation. Increasingly these are integrated with concepts such as local economies, life ways and alternative development. It is now understood that conservation cannot exist outside a framework that includes people and their culture, and traditional ways of integrating biodiversity with livelihoods.

According to Gadgil and Guha (1995:155) the forests perform five functions and these are 1) the maintenance of soil and water 2) conservation of biological and genetic diversity 3) production of biomass for subsistence which includes fuel, fodder, house building materials, medicinal plants, roots, tubers, honey etc.4) production of woody biomass for raw material for paper industry, timber for furniture and 5) production of non-timber biomass such as leaves, cane, fibers, latex, bamboo etc. The first two functions are associated with the ecological conservation of the forest, the fifth fulfills a substance objective and if sufficiently developed also provides the local people with development options while the fourth is primarily a development objective and mostly benefits outsiders although it may provide locals with jobs and some incentives. Those who advocate a purely conservationist approach are more interested in the second function namely conservation of genetic and biological resources and consequently for preserving water bodies and soil. Those who are interested in communities and development of the people are interested in maintaining subsistence base and in providing livelihood through the third and fifth functions while those interested in commercial exploitation are only interested in the fourth aspect.

Now since the forests in India are exclusively the property of the state, it is up to the state run forest departments to cater to the varied demands of the stakeholders and interest groups. Ethically and normatively the Forest department is supposed to take care of the common people and look into the interests of conservation and biodiversity. But in actual terms the powerful lobbying of interests groups such as big business houses wanting to commercially exploit timber or even to do mining is often given preference ; the mega development objectives of the nation is given priority over the needs of marginal and poor locals. The wilderness conservationists and the scientific foresters are two groups with widely differing interests, yet who concur in their opinion that the state should strongly and without interference from local people either empty the forests of all human presence what- so- ever (conservationist) or remove the already existing populations and replace them with modern scientists and people who have “better” knowledge of forestry. The rural people want local and community management of forest resources at least those forests that are in their vicinity. The forest dwellers wish

to be left to them inside the forest and are allowed to pursue forest products for use and exchange. But the industrial lobby has seriously undermined the claims of subsistence users. In fact for the past couple of hundred years, the emphasis is gradually shifting from subsistence use to market profits; from local use to gradually what is now a global market system.

The challenge that India faces according to Gadgil and Guha (1995: 156) is to both maintain its immense biodiversity and to feed its vast population and achieve a respectable rate of industrial growth to compete in the world economy. For the sake of a balanced and sustainable ecology, the biodiversity must be maintained over the genetic, species, ecosystem, landscape and regional levels. Also for conservation there is always a relative value, like medicinal plants over poisonous weeds and butterflies over mosquitoes. Thus there are aesthetic, moral and scientific values of conservation. However the question that may be raised is that is it enough to conserve only selected areas, like nature parks biosphere reserves. There is something called a "transformative value' of nature, that is ultimately whatever we are looking for in conservation includes the human values that value nature. Thus nature conservation is also ultimately a human value.

In India nature reserves cover only 4% of the country's surface and these too are subjected to timber extraction for commerce. The state is blind to local sentiments and lifestyles and following the stereotypical narratives as discussed above, forest dwellers are often pushed out of forests that result in more damage to them. The protective functions such as conservation of sacred groves and sacred flora and fauna practiced by the forest dwellers are no longer operative or recognized. Since they are deprived of their resource base, poverty and loss of income may push them into illegal activities that further stigmatizes them and creates a cycle of exploitation.

As Gadgil and Guha point out such a strategy is one aspect of an overall development strategy that seeks to divert resources to urban and elite areas taking away the subsistence base of marginal people. The ecological imperative is paid lip service by creating reserves that are meant for biodiversity protection yet which are only a fraction of the real biodiversity in the country. The focus on nature reserves diverts attention from real biodiversity conservation as by protecting patches of land. The rest of land is either laid waste ecologically or put under monoculture and commercial farming. It would yield better results if the species rich natures reserves are embedded in a richer and wider matrix of biodiversity that can be maintained at urban parks, roadside plantations, and village commons, and even if they are in various stages of use and degradation, a very large amount of species can still be maintained on them. As we have already discussed nature and human habitation are not necessarily antithetical to each other. Also small and local ecologically rich systems can add up with each other to give a wide coverage and about 40% of land can be covered like this. Such buffer zones will allow dispersal from one reserve to another especially when some of them may get endangered by climate change and global warming.

Thus what is being put forward is that it need not be nature reserve or nothing. Even in and near human habitations a large number species can be preserved and sustained and often with active human participation.

There are several reasons why the state is not a good protector of such biodiversity

1) It may not have the information needed to make appropriate decisions. Since the administration mainly consist of people drawn from elite and urban sections of population who have no direct stake in the environment.

2) There does not exist sufficient motivation for the administration to maintain biodiversity as their life style is not affected by loss of species.

3) The state does not have enough knowledge to maintain biodiversity programs. It is usually the people who have had sustained relationships with nature who have the knowledge, known as Traditional Ecological knowledge to effectively maintain biodiversity.

4) The state is unable to do policing of resources unless helped by the local people.

Thus the best solution is to make the local, territorial groups who directly benefit from the biodiversity to take care of it and to effectively guard it. Such groups can be caste or tribal groups or village clusters, but the important thing is that they should be both dependent on their environment. The community will engage sustainably with their resources if they stand to gain in a long term towards their sustenance. They will also try to increase the value of these resources, like we have discussed in the example from Africa. But essentially the interest of the community will be retained as long as they are able to enjoy the fruits of their labour and keep out the outsiders. Most forest dwellers lost the will to take care of their environment once they saw that their resources were being usurped by outsiders and also they were being marginalized on their own lands.

However even if the rights to community resources are returned to the original owners, under pressure from outside market forces they may be tempted to convert to monoculture and cash cropping, like the men folk in Garhwal who wanted to cut their forests to plant potatoes. Here it may be necessary under present conditions to compensate the community for protecting and enriching the resources. "Such rewards may be untied funds coming to the community to be devoted either to community works such as educational or health facilities, or to be shared among all community members. The rewards could also take the form of building community capacity for maintaining enhanced value of biodiversity within their territory, or for setting up bio-diversity based enterprises, such as chemical prospecting or extraction of active ingredients. Similar rewards may also flow for making available knowledge pertinent to uses of biodiversity, for instance in pest control". (Gadgil and Guha 1995:162)

Check Your Progress 2

Note: a) Use the space provided for your answer

b) Check your answers with the possible answers provided at the end of this unit

1) What contributions do Mangrove forests make to the local people and to the environment?

.....

.....

.....

2) Is it necessary to remove people in order to conserve nature? Discuss with examples.

.....

.....

.....

.....

3) Why state is not successful in the protection of Biodiversity?

.....

.....

.....

.....

.....

3.8 LET US SUM UP

- The best solution for maintaining a good forest cover, biodiversity and an extensive enriched environment cannot be done by imposing policies and technologies from outside.
- The elite urban dwellers far away from forests have been entrusted with making policies and implementing plans with respect to the forest and associated biodiversity.
- For long term sustainable use of resources, the care for these must be entrusted to those who are most closely associated with them economically, ecologically and emotionally.
- Under changing circumstances, if the people are not finding the dependence on natural resources rewarding they may be given various incentives to continue to take care of their environment.
- The real contribution of policy makers is to make this happen. Instead of imposing from outside the policy makers must partner and cooperate with the local communities to take care of their resources and also to enhance the value of these for themselves and for others.
- Nature without people and people without nature are both untenable. Real sustained development will come when both are integrated and work together.

3.9 KEY WORDS

Sacred Groves : Sacred groves are forests of religious importance.

Mangroves : Mangroves are the trees which are salt tolerant and are found in coastal areas.

Joint Forest Management : It is a tool for forest conservation in which the state governments and local communities both are involved.

3.10 REFERENCES AND SUGGESTED FURTHER READINGS

- D' Monte, D. 1985. Temples or Tombs? Industry versus Environment: Three Controversies. Center for Science and Environment, New Delhi.
- Escobar, Arturo 2008. Territories of Difference: Place, Movements, Life, 'Redes'. Duke University Press, Durham.
- Fairhead, James and Leach, Melissa 2008. False Forest History, Complicit Social Analysis: Rethinking some West African Environmental Narratives. In Environmental Anthropology: A Historical Reader. Michael Dove and Carol Carpenter (eds).
- Gadgil, Madhav and Guha, Ramachandra. 1995. Ecology and Equity: The Use and Abuse of Nature in contemporary India. Penguin Books
- Gadgil, Madhav and Guha, Ramachandra. 1992. This Fissured land: An Ecological history of India. Oxford University Press, Delhi.
- Ganguly-Thukral, E. (ed). 1992. Big Dams, Displaced People. Sage Publishers, New Delhi.
- Guha, Ramachandra. 1989. The Unquiet Woods: Ecological Change and Peasant resistance in the Himalayas. Oxford University Press, Delhi.
- Lal, J.B. 1989. India's Forests: Myth and Reality. Nataraj Publications, Dehradun.
- Rangarajan, Mahesh, (ed) 2007. Environmental issues in India. Pearson Longman
- Rangarajan Mahesh 2000. India's wildlife History: An Introduction. Permanent Black and the The Ranthambore Foundation.
- Singh, Neera M. 2004. Women and Community Forests in Orissa: Rights and Management. In Livelihood and Gender: Equity in Community Resource Management. Sumi Krishna (Ed). Sage Publications, New Delhi.
- Vasundhara 1996. Ecological, Institutional and Economic Assessment of Community Forest Management in Village Gadabanikilo (mimeo). Bhubaneshwar, Vasundhara.

3.11 KEY TO CHECK YOUR PROGRESS

Check Your Progress 1

1) Your answer must include the following points
   - Conifers, oaks, pine, fir, spread, sal, rhododendron.
   - Excessive deforestation.
   - Broad leaved varieties replaced by conifers.
   - Negative environmental factor such as heavy siltation, flood, soil erosion.
2) Your answer must include the following points
   - Restrictions on forest tracts

- Recent tribal bill
- Commercial forestry, deforestation and environmental degradation
- Forest and forest dwellers livelihood.

Check Your Progress 2

1) Your answer must include the following points
   - A repository of Biodiversity.
   - Maintenance of water quality.
   - Storehouse of fish & other various fauna
   - Provide food, fuel, shelter
2) Your answer must include the following points
   - The locals and their presence in the regeneration process.
   - Judicious use of scientific technology.
   - Integrated vegetation management practices
3) Your answer must include the following points
   - Lack of information.
   - Lack of motivation.
   - Local knowledge and participation is not appropriately incorporated.

ignou THE PEOPLE'S UNIVERSITY