
CHAPTER FOUR

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CONCLUSIONS

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The orography of the Western Ghats interacting with the winds of the south west monsoon leads to the highest level of rains for Peninsular India on the crestline of the Western Ghats. This heavy rain, coupled with the steep westward slopes of the ghats render this an ideal location for the generation of hydroelectric power, and many such projects ex. Koyna, Radhanagari, Dhom, upper Bhawani, Idikki have been completed on this hill chain. The major eastward flowing rivers of penninsular India - Godavari, Krishna and Kaveri - all originated on the Western Ghats and the region where the hills of the Ghats merge with the Deccan plateau furnishes ideal conditions for the constructions of irrigation projects have been completed in the recent years.

There is, however, a paucity of comprehensive case studies In India while we have constructed well over 1500 big dams, there is not a single 'post-facto' evaluation report warth the name to show that the benefits claimed had indeed been realised. We have, moreover, the dubious distinction, according to a report of the International Commission on Large Dams, of the second largest incidence of dam failures in the world at 9.2 per cent i.e., 40 big dams of the 433 built between 1874 and 1975 had failed (Paranjpye, 1988).

The adverse impact of dam projects in the country, for last few decades, have raised concern in the conservationists and Scientists in the country. Agarwal et al. (1982, 85) in the two excellent reports have evaluated the impact of the developmental projects and the present status of environmental

problems and their relation with dam projects, biological diversity, human population, pollution, agriculture, water resources etc.

The western ghats today harbour almost the entire forest wealth of states of Gujarat, Maharashtra, Goa, Karnatak and Kerala, and these forest resources are already in short supply. Moreover, the irrigation and hydro electric projects have led to serious deforestation not just in the submersion area, but in the vital catchment area aswell. This in turn has enhanced the soil erosion in the catchments and siltation of the reservoirs. It has sharply reduced the diversity of plants and animal and has led to ecological disturbance. All of this has serious long range economic consequences for the society as a whole, but its more immediate victims are the local peasants of the Western Ghats.

The Western Ghats are second only to the Himalayas in the diversity of its plant and animal life with a large number of species being confined to the region. The tract also has many wild relatives of cultivated plants and number of indigenous cultivated crops and domesticated animals. This biological wealth has been rapidly declining in recent decades with a diminution in the area occupied by natural biological communities and their fragmentation in ever tiny fragments.

According to the renowned Indian ecologist Prof. Madhav Gadgil (1981) it is necessary that we prepare a very careful plan for the conservation of this biological diversity by identifying the remaining good examples of each of the biological

community types of the region. We should then ensure that a few representative samples of each of these community types is given long term protection. While organising this net work of nature reserves, it should be borne in mind that the long term prospectus of species survival increase rapidly with an increase in the area of the total habitat and with the richness of the habitat mosaic. We should, therefore, constitute a few large bio-sphere reserves with substantial areas of variety natural biological community types.

Keeping this theme in mind Koyna dam catchment, a unique geological and geographical feature in this part of the country with its excellent biological diversity, was declared as the Koyna Wildlife Sanctuary (423.5 sq km). The Sanctuary with the sensitive adjoining areas in the catchment and outside are proposed to be considered for future Koyna Biosphere Reserve, the first in Maharashtra and only of its kind in the country. While protecting the natural habitats and wildlife, it is necessary that we have to develop ways and means of reducing their conflict with human population. Crop raiding by Wild pigs, Gaur, Sambar and killing of cattle by tigers and panthers are serious problems causing huge economic losses to poor farmers. We should also provide a certain minimal level of compensation wherever it is justified. We will have to make special attempts to change the attitudes of the local people towards wildlife and make them aware of environmental problem caused by their traditional and now unscientific activities like Rab and shifting cultivation, free grazing, deforestation

use of inefficient hearths, etc.

Considering the various ecological problems existing in the Koyna Catchment, mainly due to the dam construction and changing agricultural practices, it was found advisable to assess the impact of these activities on the animal diversity of the region, particularly common mammals.

However due to the limited scope of the research and time at disposal, one year, the work was restricted to a few important parameters only namely, impact of submergence and seismicity, hunting, agriculture practices, animal husbandry, free grazing, crop pest and predations etc.

It was hoped that the basic finding would be useful get an idea about the environmental problems and their magnitude from the study area a newly declared wildlife sanctuary. Thus the results of the study have applied significance.

The main impact of Koyna dam construction on the animal diversity was the impoundment which submerged 11,535 ha of mixed land including forests, grassland, wasteland etc. The initial rapid filling of the reservoir cut off the escape routes of the terrestrial and arboreal mammals. The faunal destruction was not only because of the submergence but isolation of animal populations and their non viable dispersal in the upper catchment. The submergence also destroyed local migratory routes, habitats, feeding grounds, and shelters.

The shrinkage of habitat, of most species in the upper catchment due to the submergence in the river valley, resulted

in increased initial population density and this along with the loss of vegetation cover and influx of outside poachers and hunters resulted in serious damage to animal diversity. Thus right from the first day of dam construction degradation of animal life has been witnessed in the study area.

Though initially there was an earthquake in December 1967 which caused heavy damage of life and property absolutely no records are available of its impact on wildlife. The residents had not observed anything peculiar in the animal behaviour prior to or immediately after the incidence. However some scanty reports mentioned of birds leaving the nests, reptiles coming out of hiding places and large mammals leaving their territory. But these observations could not be confirmed.

Though it is difficult to correlate the drop in rainfall to degradation of vegetation in a given area over short period of study, the analysis of the rainfall data of last thirty years revealed some interesting facts. It clearly showed difference in rainfall in the two catchments, i.e. east and west of the narrow Koyna valley, more prominent today than in the past. Also there is clearcut decline in the rainfall values (minimum, maximum and mean) and the number of rainy days at all the four recording stations. This could not be merely a coincidence. Therefore there is a strong and sufficient evidence for the first time to suggest that there could be a correlation between the deforestation and decline in the precipitation in the area.

The profile of the villages in the study area also

revealed interesting picture when the land composition in the west, east and outside the catchment was studied. The difference in the composition in just 20 years after the construction of the dam was striking. The cultivated land increased 6.7 times in the east catchment where as rate of change was 4.2 times in the west catchment and only 2 times outside the catchment. This agricultural development was almost directly proportional to degradation of forest and reduction of culturable waste land and non cultivable lands. There was hardly any change (.4 %) in the not available for cultivation land in the west catchment but in the east it was -85.5 %, it was only -48.1 % in outside catchment villages. Similarly the change in the culturable waste land was maximum in the east catchment i.e. -92.9 %, followed by outside the catchment -98.3 and -69.2 % ha in west, respectively. In case of loss of forest land it was more in the west catchment i.e. -71.4 ha, followed by.

There has been phenomenal degradation of vegetation in the eastern catchment of the Koyna dam project. Easy accessibility; road facility, proximity to tahasil and other townships are some of the reasons of this change. Similar negative change has also been recorded in outside the catchment villages wherever road facility has reached. Therefore it is feared that if as proposed in the district development plan road facility is provided to the settlements in the west catchment the vegetation will disappear in no time which would be a detrimental change for wild animals.

In casual observations the dominant plant species recorded

during field work which numbered 102, out of which 81 were trees, 12 shrubs, 5 climbers and 4 grass species. This is an indication good floral diversity of the region.

It was revealed from earlier records (Samant et al., 1988) that the Western Ghats region has excellent animal diversity which was represented by 79 sp. of mammals, 412 sp. of birds, 71 species of reptiles, 166 sp. of fishes and 20 species of amphibians.

The 31 common mammal species studied belonged to 7 orders, 1 sub order, 16 families. The total number of bird species recorded during the investigations was 136, they represented 18 orders, 41 families and 8 sub-families. Reptalian animals recorded were only 17 in number from 2 orders, 2 sub orders and eight families. The reservoir fish fauna, along with the exotic fish species has increased upto 32. There were 5 orders, 4 sub-orders, 10 families, and 2 subfamilies.

Studies on present status of the 31 mammals studied revealed that 18.33 % are common, 24.16 % are uncommon, 35.33 % have become rare and 21.33 % of the species recorded earlier in the area have become absent.

While considering the past and present status of the 31 common mammals it was observed that 51.61 % were still found commonly. 9.67 % have become uncommon from common, 22.58 % became common to rare, 9.67 % have become absent from common and 6.45 % of the animals which were uncommon in the past have become rare today. This indicates that more and more common

animals are becoming uncommon and rare. This is directly related to the drop in the quality of environment.

The villagewise distribution of wild mammals confirmed that though there was not much difference in the distribution of uncommon species 25.26 %, 28.23 % and 20.33 % in the east, west and outside the catchment meaning there was almost uniform distribution of the uncommon species, perhaps this was because of the stray animals having very low population density in the study area.

The common species were more in the west catchment (23.78 %) followed by outside villages (17.82 %) and east catchment (11.82 %) these were larger mammals and predators found in the forested areas in the Western Catchment. Contrast to this more absent species were recorded from east (30.58 %) outside (16.12 %) and least in the west zone (13.33 %). This clearly indicates that there is a direct correlation between the status of the animals and the quality of the vegetation in the Koyna Catchment.

Traditional hunting is very common in the study area. Community hunting is done on specific days like 'Dasara' but once a week people go for hunting which provide them cheap animal protein at their door steps. There is no specific choice for animal and a wide range of animals are killed and consumed. Poaching by outsiders has increased in the recent years with the development of roads and removal of forests and wildlife in other areas. With use of powerful firearms larger animals are killed

by the outsiders. However subsistence hunting continues unaffected.

Hunting/Poaching and habitat destruction due to deforestation and agricultural practices are the important parameters after the dam construction era in the Koyna catchment.

Except the unprecidental increase in the porcupine and wild pig population of crop pest other conventional crop pests like Sambar, barking deer etc. are on the decline. The increase in both the primate species, i.e. Hanuman langur and Bonnet monkey, as pest on crops is attributed to the destruction of arboreal habitat in clear felling of large mature trees in the villages as well as forest. New crop protection are needed as the conventional ones are no more found effective with the introduction of exotic crop species and the removal of the natural habitats of the pest species in the surrounding areas.

Another indication of the degradation of environment is the changing pattern and composition of livestock in the area. The original buffalo herds maintained by Gavli Dhangar were supported on green fodder and plenty of water. After the scarcity of the resources cattle population increased till the point when this could also no longer be found viable and recently there has been introduction of goats in the area. This should be taken as an indication of environmental change.

The traditional agriculture practices of 'shifting cultivation' and 'Rab' have proved to be disastrous for

animal diversity in the study area it reduces the habitat, fragments the vegetation, destroys the plant seeds and micro-fauna and flora of the region and brings hindrance in regeneration of vegetation, top soil erosion, land slides, loss of water table are the side effects of this damage.

There is almost total dependence on the forest for subsistence for fuel wood, fodder, minor forest produce, building material etc. The impact was dependent on the population density in the settlements. The fuelwood extraction is one of the major activities in the households of the study area. The mean distance travelled per day, one way was 4.64 km and time required was about 4 hours. The annual fuelwood requirement of a household was worked out to be around 20,000 kg, which comes to about 20,580 Tonns/year for the study area which is equivalent to 235.2 ha of prime forest every year in the study area or at the present rate of Rs.400/- per tonn. the annual requirement is of the order of Rs.82,32,000/-. This is exclusive of the illicit tree cutting by contractors for timber, fuelwood or charcoal^a making. These figures give us a rough idea of the costs of destruction by the forests conservative means.

The large domestic animal population from the study area is seen directly competing for fooder, spare, water etc. with the wild animals in the already reduced natural grazing lands and forested area. Therefore the animal husbandry practice which is continued as a suplimentary occupation to agriculture is providing equally detrimental to wild herberous.

So far there has been good water supply mainly through

spring to the villages. However the villagers are not allowed to use water from reservoir for agriculture purpose. This limits the perennial and adequate water supply to vast cultivation lands.

The recently introduced reservoir fishery has good potential for the supply of cheap animal protein to local people. This might reduce the pressure on poaching for meat. Also it has potential for local employment. A local voluntary organization is trying in this direction.

Majority of the residents (74.49 %) of the area are below poverty line and have not been benefited by the dam construction till today except one or two roads and electricity in few villages. They have obviously strong reactions about the handling of the dam problems by Government. Unfortunately the rehabilitations problems are not solved even after almost 30 years after the construction of dam. Because of the past experience the people want total rehabilitation and cash compensation if the wildlife sanctuary comes in existence and its rules are enforced.

In short the study area is the last strong hold of excellent animal diversity in the Western Ghats of Maharashtra. After the construction of Koyna hydel project the direct and indirect destruction of the biological diversity of the area was initiated which has now reached unexpected dimensions. For the very existence the local populations have depend totally on the forest resources which are dwindling very fast further

deteriorating the socio-economic conditions of already poor people living near poverty line. These people inspite of their sacrifice have remained out of the main stream of development and are now aware of the loss and are demanding for justice.

Because of the sensitive nature of the area, as a vital catchment of the Koyna dam which supplies major share of electricity to the most industrialized state in the country, it is essential to enforce all the possible measures to conserve the area, basically its vegetation, which would protect the dam, animal populations, water resources, agriculture and local man. Declaring the area as a Wildlife Sanctuary is a positive step in this direction. Hopefully this will not create any conflict between Wildlife and local man. But the rightful decision will be to convert the entire Koyna Catchment into a Biosphere Reserve on Scientific basis where due importance will be given to local peasants and not only to wildlife which should subsequently lead to coexistence as it had always been in nature.