CHAPTER FIVE

CONCLUSIONS

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The Western Ghats region of Maharashtra is important in many ways to the vast human population in the State and beyond. The Ghats with heavy annual precipitation on the Western hill range support rare and thick sub tropical evergreen and semi-evergreen vegetation, protect complexity of wildlife habitat, supply the vital water resource to agriculture, animal husbandry towns and industries etc.

In the Chandoli Wildlife Sanctuary the average hight of the hill range is about 900 meters. The hill tops and plateaus are covered by a thick layer of laterite and patches of characteristic stunted evergreen and semievergreen vegetation. Whereever deforestation has taken place in the past, either due to clear felling or shifting cultivation, the top soil has been reduced by erosion and the process of laterization has set in. This has resulted in the reduction of fertility and quality of soils available for natural regeneration of the vegetation. Due to the three distinct seasons, except in the four months of rainy season (June-September) the climate is generally dry, this situation is enhanced by the moderate wind speed prevalent throughout the year.

Though the monsoon rainfall in the region is high (5279 mm). It is observed during the investigations that many perrenial springs, used by man and wildlife alike are no more perrenial and many of them have started drying up during summer months. There has been gradual drop in the annual average rainfall in the region (Table 2 fig. 5), and during the study period i.e. in 1987 there was the worst drought throughout the

Western Ghats. It is not possible to establish any correlation between the loss of forest and the decline in the rainfall in a short duration i.e. the current study period, only the monitoring of various important meterealogical factors over a period of several decades could give a proper picture of the change in the rainfall. The use of satellite imagery in the study of deforestation processes would improve the predictability of such monitoring. However, the general impression from the field studies and the opinions of the respondents strongly suggested that the recent degradation in local vegetation has correlation with the reduced water discharge and duration of the availability of water. The endemic flora and fauna is very sensetive to the changes in the microhabitats.

The rich plant diversity from the Western Ghats has been reported by Samant et al. (1986). The study area included Chandoli Wildlife Sanctuary, where out of the 230 major plant species recorded 57.4% were evergreen and semievergreen type 37.8 % moist deciduous type and only 4.8 % were of deciduous type. Interestingly out of these only 4.93 % were abundant and 19.13 % commonly recorded. Perhaps this reflects on the changing nature of the floral diversity in the sanctuary as it is well known that in the tropics the biological diversity in a unit area is much more than temperate regions and in the studies by Samant et al. (1986) few species appear to dominate the forest vegetation.

A rich faunal diversity has been reported from the Western Ghats (Samant et al. 1988). In the evergreen and

semievergreen habitats 92.9 % cf mammals, 82.4 % of birds, 71.0 % reptiles, 27.6 % of fishes and 90.9 % of amphibians reported in the state of Maharashtra were recorded. This excludes only the grassland and aried zone fauna of the State.

There are about 55 National parks, 247 Wildlife Sanctuaries in the Country. In Maharashtra there are 4 National Parks and 10 Wildlife Sanctuaries. In addition to this 5 new Wildlife Sanctuaries have been created in 1985, including Chandoli Wildlife Sanctuary, for the purpose of protecting, propagating or developing wildlife there in or its environment. There are 16 wildlife reserves in the country which have been given the status of Project Tiger.

The newly created Chandoli Wildlife Sanctuary (308 sqkm) covers the entire catchment of the Warna dam under construction and some adjoining area. This area is from the four administrative districts with different geographical and socio-economic backgrounds. The very nature of this situation has some peculiar problem created right from the beginning. Out of the original 33 villages from the study area 9 villages are completely submerged and 5 are partially submerged. In some cases either only the agriculture lands are submerged or the settlements. In the former case the people without land have made little encroachments in the earlier intact wild habitats as they had no alternative for their subsistance. Where only the settlements are partially or completely submerged. The villages are rehabilitated outside the catchment area and their cultivated lands have become fallow lands. Since the impound-ment has submerged the low and flat lands in the Warna river

basin the fallow lands are on the slopes of hills and would provide good grazing areas for wild herbevores.

During the present investigations the major problem encountered was total lack of any previous basic information or literature about flora, fauna, hunting, grazing, agriculture human population etc. about the study area. Therefore most of the information collected and presented in this report is for the first time. Also due to the nature of the work, scope of the research and facilities available the research plan was prepared mainly based on the field observations and indirect information by interview technique to get information about the past and present status of the environmental situation and human activities in the Chandoli Wildlife Sanctuary. This strategy was proved very successful and a vast useful data was generated.

The entire subsistance of the local inhabitants depends on the forest resources. The conventional agriculture practices of the region of shifting cultivation and increasing grazing have been found to be major human activities along with the unabated poaching possesing serious threat to the dwindling wildlife diversity of the study area.

With the begining of the construction of Warna Dam many new developmental activities i.e. construction of roads in the interior catchment, transmission lines, establishment of large labour camps and workers colony, initial work of Tanali hydel project etc. have enhanced the outside human influence in the sanctuary area. The all season road facility in the area is bound to create a situation where the large scale interference

of the wood contractors with the help of local population, is going to cause serious damage to the forest habitat by increased illicit wood cutting. The outside influence has also agrevated the poaching activities in the region. Under the pretext of crop protection and traditional ritual hunting a large spectrum of wild animals belonging to different habitat and niche are killed indiscriminately for subsistance or trophy purpose.

The 30 mammalian species studied in detail due to their closer interaction with the local human population belonged to 6 orders and 16 families. Out of these species 7 were from the schedule I and II each, 5 from III, 9 from IV and 2 from schedule V respectively of the Wildlife Protection Act (1972) of Govt. of India. This indicates that 50 % of the Wild animals studied from the sanctuary are the ones which confront with human population or get killed and are catagorized as endangered or strictly protected in schedules I and II. Therefore the damage caused to the Wildlife diversity is phenomenol.

However this damage to the wildlife habitat and its intensity depends primarily on the density of the human and domestic animal population, the carrying capacity of the area, nature of habitats, vegetation, wildlife density and diversity and the major physical factors.

On the basis of the data generated during the present investigations the zones A, B and C have been suggested for the protection of natural habitats and the wildlife therein. Consideration has been given to the composition of lands, land use and, accessability richness in biological diversity and the

future wildlife management potential.

The zone A should be considered as the core zone of the Wildlife Sanctuary and be treated as "sanctum sanctorum". The zone has about 10 settlements and it comprises of the sizable area i.e. 46.7 % of the total sanctuary area. Due to the richness of the forest vegetation of the area and higer density of rare and endangered animals in it, the area is most suitable for the purpose. Also the higer attitude,remoteness, escarpments on west providing natural barrier and thin human population makes it cost effective to manage.

The zone B with 31.7 % of the sanctuary area and 7 villages can serve as buffer zone of the sanctuary. This zone is on the either side of the main body of reservoir and has many open patches or grasslands and plateus. The fallow agriculture land of the dam affected people can perform the function of grasslands or meadows very much necessary and suitable for the wild herbevores. Unless there is a substantial increase in the prey population a viable carnivore population can not be supported in the sanctuary.

It is also necessary to reduce the domestic animal populations and their range of grazing in the study area. This has not only posed increasing competition for food and space but has a potential threat of the spread of diseses like Rinderpest and Foot and Mouth. In the past these epidemics have caused a great damage to Wildlife in many Wildlife Sanctuaries in the country.

The distribution and status of wildlife was dependent

on the nature of the habitat and the characteristics of the wild animals. The villages with thick vegetation in the surrounding area, from the zone A had uncommon species like tiger, panther, wild cats, wild dog, bear, gaur etc. even if in small numbers. The degraded areas on the otherhand supported comparatively larger populations of commonly found wild animals like wildboar, hare, barking deer, porcupine etc.

The inverse correlation between the qualitative richness and quantitative values in faunal diversity was the characteristic of the study area. Due to the heavy subsistance of the local population on forest for natural resources (99.25 % for fuelwood) there is a constant decline in the natural resource. Only 4.5 % of the respondents have reported shortage in the fuelwood supply today, this can be taken as an indication of the gradual change in the earlier thickly forested area. The 94.3 % of the respondents who did not report any shortage in the fuelwood supply were not aware of the change perhaps because of their ignorance of the shortage of fuelwood in other areas or mainly the still intact forests they heavily depended on.

This decline in the forest resource can be clearly seen from the respondents (30.5 %) who complained about more time required now for collecting the fuelwood. This could be basically due to the over exploitation of fuelwood in the near visinity of the villages and the longer distance travelled to and from the remote forests resource.

No correlation could be established between the average distance travelled and time required for collection of fuelwood

in different villages as it was dependent on a large number of variables i.e. population density, availability of fuelwood, distance from the nearest forest source, topography of the area, season, area under shifting cultivation etc.

An average of 16.02 Tons/year (7.33 Tons S.D.) is the household requirement of fuelwood in the study area. For the Southern Western Ghats the average is about 11 Tons/year per household (Samant et al., 1988). The higer values from the Chandoli Wildlife Sanctuary is attributed to the better condition of forest of the region. The annual fuelwood utilization by the local people is estimated to be 21,782 Tonnes. The dam colony and labour camp consumes more wood which was not estimated during the investigations. Also the quantity of clearfellings by illicit wood contractors and loss of vegetation due to shifting cultivation could not be quantified due to lack of any data. However, it was clear from the field observations that this quantity was obviously much more than the fuelwood used by the locals. One estimate shows that even if the fuelwood alone is considered it amounts to 249 ha/yr. of prime forest in the study area.

Apperantly the water resources do not play any decisive role in the distribution of wild animals in the high rainfall area. Also there was no direct correlation between changes in the water resources due to human utilization and wildlife diversity. The time required and distance travelled by the local people in fetching their daily water requirements was an indication of the changing nature of the water sources. Apperantly there is slight degradation in some of the water

resources which is attributed to the reduced discharge of sub soil water storage due to the removal of vegetation cover from many micro catchments.

The present human impact on the wildlife in the Chandoli Wildlife Sanctuary is mainly of two types I. Direct impact by hunting or poaching and II. Indirect impact through deforestation, habitat destruction, grazing, etc. The loss of wildlife due to poaching was very difficult to record due to the very nature of the illegal act. Also out of fear of being caught by the forest staff the locals were also very much relactant to provide precise information about skins, horns, etc. However, through secondary sources much clearer picture of the nature and magnitude of the activity could be collected which revealed that poaching is very common and a wide spread activity in the sanctuary.

The local population indulge in hunting throughout the year to meet their meat requirements. Almost in every village there is a one day per week reserved for hunting. Individual and group hunting are two methods used for hunting with the help of local country made fire arms and shotguns issued for crop protection purpose. Some times local hunting gear like snare and nets are also used depending on the nature of the hunt and animal involved. The number of outside hunters coming for larger 'game' is on the increase with the improved accessibility to the remote forest areas. A strict vigilance on the part of forest department is essential to curtail the present hunting activity in the Chandoli Wildlife Sanctuary.

Agriculture practices in the Wildlife Sanctuary play a

major indirect role in the existance of the wildlife in the area. With 37 % of the households having more than 10 acres of land holdings and out of the total population 59.4 % involved in the destructive shifting cultivation practices the areas suffers a great loss of vegetation, top soil, and animal diversity. The so called Rab practice in the conventional agriculture has also adverse impact on the environment. Firstly due to lapping of trees and reducing their life and secondly by burning the folliage on ground in large areas to destroy ground fauna.

Due to the increasing demand for land for shifting cultivation in 8 villages i.e. 33 % of the study area, shifting cultivation was performed in forests on government land. The shifting cultivation, lapping of trees and deforestation for fuelwood has created barren patches and corridors in isolated forests which prevent the necessary local migrations of terrestrial mammals and arboral species. The damage caused to bird diversity was though not studied during the investigations it could be observed that the removal of trees caused a great loss to bird fauna in the form of habital, nesting sites, feeding grounds and shelter.

The loss of natural habitat wild animals have created a general imbalance among the behaviour and composition of crop pest species. The striking example is of Wildboar Sus scrofa, which has spread in a very wide non forested area causing increased man and wildboar interaction (Ahamed, 1988). The loss of natural arboral habitat has increased the problem of primate

pest on agriculture in the study area.

The increase in the crop pest problems due to the alterations in environmental parameters have added to the hardships of the local farmers. The already poor crop yields are though protected with all the available man power and resources the hevy losses due to pest are just inevitable.

Animal husbandry is a traditional occupation of the pastoral Gavali Dhangar Community in the Western Ghats. But during the investigations it was observed that the community has switched over to agriculture and animal husbandry has become secondary occupation for subsistance of the residents of the area.

The grazing practice is of free grazing with or without cow herds in the forested areas. Because of the lack of land restrictions the hud size is usually large and there is no check on the population of the non productive animals. Therefore the domestic animal population (16,592 heads) of the area certainly has significant stress on the existing grasslands and forest area.

As reported by Gadgil and Malhotra (1979) there has been drastic change in the livestock pattern in the Western Ghats, which is also true for the sanctuary. The earlier sound natural vegetation supported large buffalo populations which are now shifted to cattle due to degradation of habitat. The loss of forest, plenty of water and green fodder has resulted in the decline in the buffalos. The cattle manage with less quantity of water and comparatively coarse and inferior grasses. The recent introduction of goat population in the area is an

indication of rapid degradation of the ecosystem.

The impact of dam construction on the wildlife diversity of the area was apperantly not noticed directly except at the dam site, and other places where construction work started. However the construction of roads in the catchment and other associated developments exposed the remote inaccessible forests to outsiders mainly to poachers and tree contractors.

Therefore if we see the developmental process in the catchment area due to dam construction the picture is grossly negative. The residents of the catchment said that there was no improvement in the state of agriculture, job opportunities, medical facilities, rise in income, govt. administration etc. Only slight increase reported was in the fields of roads and electricity i.e. 4.18 % and 6.87 % respectively. In general the people from the catchment area of Warna dam have not been benefited by the dam and are still living in the same poor conditions.

When enquired about their choise of compensation to be given for rehabilitating them outside the wildlife sanctuary limits or in the buffer zone i.e. zone C, The reaction of the people was very interesting. About 97.6 % opted for land compensation and 95.95 % for total rehabilitation outside the difficult Chandoli Wildlife Sanctuary area. This has for the first time given us an idea of the people's wish to leave the area without any demands or conflicts to stay in the sanctuary as many local politicians have stated other way round.

Now it is duty of the state Government to give the land

for land compensation and proper and complete rehabilitation of the sanctuary affected people to set an example before others. There are many areas where much more systematic research work is needed before drafting the effective wildlife management plan for the sanctuary. There is tremendous potential for further research in the Chandoli Wildlife Sanctuary for which a basic data has been collected with was one of the objectives of the research undertaken.