Chapter 5

Discussion

5.1 Objective – 1
To assess the level of awareness amongst the villagers and the extent of their involvement in planning and implementation

5.1.1 Level of Awareness
The level of awareness of the villagers about ecodesvelopment programme and ill-effects of over-exploitation of forest resources was assessed through examination of the record pertaining to the meetings held by forest officials with the villagers including EDC members before and after start of ecodesvelopment, personal interaction with EDC members during this study and analysis of the responses received during the personal interviews.

From the meeting registers, it is observed that a large number of meetings were organized between the forest officials and the villagers/EDC members before and after commencement of the project. Before commencement of the project, meetings were held with villagers to discuss pre-project issues. In Sarwa, 3 meetings were held in 1994 attended by 14 forest officials and 84 villagers. In Kalambha, one meeting was held in September 1994 attended by 5 forest officials and 50 villagers. In Mandur, 2 meetings were held in 1994 attended by 8 forest officials and 105 villagers. One meeting held in
Munawale in 1994 was attended by 4 forest officials and 98 villagers. In Borbet, two meetings held in July 1994, was attended by 4 forest officials and 53 villagers.

A large number of meetings were also held during the implementation of ecodevelopment. In Sarwa, 29 meetings of EDC/Executive Committee were held from 1995 to 2000. In Kalambha, 5 meetings of EDC and 6 meetings of Executive Committee were held from 1995 to 1999. In Mandur, 24 meetings of EDC/Executive Committee were held. In Munawale, 10 meetings of EDC and 11 meetings of Executive Committee were held. Lastly in Borbet, 15 meetings of EDC and 18 meetings of Executive Committee were organized. Regular proceeding registers have been maintained in all the villages.

During the household survey, a very high proportion of 96% of 114 respondents in the six study villages have indicated that the villagers were consulted while preparing the ecodevelopment plan. Similarly 93% respondents have mentioned that the suggestions of the villagers were incorporated.

During this study, informal interactive meetings were held with the villagers in all the six study villages where it was found that they were well aware about the implementation of ecodevelopment in their village and the basic objective of reducing their dependence on PA resources.

5.1.2 Ecodevelopment Planning

Ecodevelopment was identified as one of the important initiatives under World Bank assisted Maharashtra Forestry Project. The Project Implementation Volume (PIV) and Staff Appraisal Report (SAR) provided the basis for ecodevelopment planning. The modalities for this purpose were enunciated in various Government Resolutions issued from time to time during the currency of the project. The basic objective of the ecodevelopment was to reduce the dependence of the rural communities on forests. A village was identified as the unit for management and 60 households were envisaged to be registered as ecodevelopment committee members. A detailed micro-plan was to be prepared with the active involvement of ecodevelopment committee members within the overall project framework.

It is well established that the rural communities depend on forest for their livelihoods. The degree of such dependence varies with the socio-economic status of the village, its proximity to the forests and availability of alternative sources of livelihoods. It
is therefore, important to identify the zone of influence which is the interface between rural communities and forests. It will be more pertinent to identify a cluster of villages and the forest area, the conservation of which is influenced by these villagers. Such a holistic approach is likely to achieve the conservation objectives much better than the one followed in this project where limited village area was considered for intervention. The success of such an approach could, at best, be limited as the EDC members are free to access the nearby forests outside the project areas for meeting their forest-based needs and also the communities from the nearby villages have, except usual legal restrictions, no morally or voluntarily accepted restrictions on accessing the forests within the village boundary.

The success of ecodesvelopment planning was assessed by identifying five attributes. The overall success of ecodesvelopment planning was categorized as high by 42% respondents, medium by 37% respondents and low by 21% respondents based on mean and standard deviation (Figure 29). Ninety six percent of the respondents in the six study villages strongly agreed that they were consulted while preparing ecodesvelopment plan and their suggestions were incorporated. Ninety one percent of them also agreed (51% strongly and 40% mildly) that the plan addressed all the requirements of the village related to the Forest Department. Eighty two percent respondents agreed to varying degree that all the households were invited to participate in ecodesvelopment programme. Only 72% respondents agreed that their land was covered and 21% disagreed (Table 36).

The ecodesvelopment planning was essentially top-down rather than bottom-up, where the broad framework was provided at state-level in terms of project objectives and government resolutions. However, flexibility to some extent was provided at village level in term of identification of various activities in preparation of the micro-plan.

The village committees were not actively involved while identifying the beneficiary villages and reliance was basically made on the experience of the grass root forest officials regarding the level of cooperation expected from the selected villages for ensuring the success of the programme. This was primarily due to the fact that the ecodesvelopment programme initiation was in the project mode and therefore, target driven with strict timeline and milestones to be achieved. Better involvement of the villagers and consequently, better success of ecodesvelopment could have been achieved by devoting more time on awareness creation, rapport building and understanding the needs and aspirations of the villagers. However, it must be mentioned that once a village was
selected for ecodevelopment, forest department made significant efforts to interact with the village communities by organizing frequent meetings. 29 meetings of EDC were held in Sarwa, 24 in Mandur, 10 in Munawale, 15 in Borbet and 5 meetings in Kalambha during the project period from 1994 to 2000. Regular proceeding registers were maintained and evaluation by forest department revealed that EDC members were well aware of their duties and responsibilities.

In the correlation analysis, ecodevelopment planning was found to be highly significantly and positively correlated with ecodevelopment implementation, generation of additional employment, effectiveness of the executive committee, adequacy of the micro-plan, gender issues and overall success of the ecodevelopment. The ecodevelopment planning was, however, found to be highly significantly but negatively correlated with social participation, ecodevelopment fund and improvement in unity and understanding amongst the villagers. Ecodevelopment planning was also found to be a component of the first factor in the factor analysis which together with five other parameters explained 18.2% of the variation.

In Kondhwal, respondents with higher annual income were found to have lower level of satisfaction with the planning process of the programme. As the micro-plan was prepared in consultation with all EDC members, it appears that members with higher income group did not contribute significantly during the planning process and that their suggestions were not incorporated in the micro-plan.

In village Mandur, a significant positive correlation between ecodevelopment planning and adequacy of the programme indicates meticulous planning process involving the forest department and the villagers and points to the high level of satisfaction of the villagers with the planning process. This is a significant and important finding as one of the main objectives of the ecodevelopment programme was to involve the villagers into the planning process unlike the normal departmental activities which are planned and executed by the forest department without the active and positive involvement of the villagers. It indicates a significant paradigm shift in the forest department.

In the regression analysis, the variation in ecodevelopment planning was very significantly explained by social participation, gender issues, ecodevelopment
implementation, ecodevelopment fund, adequacy of the micro-plan and overall success of ecodevelopment.

5.1.3 Ecodevelopment Implementation

The ecodevelopment interventions as envisaged in the approved micro-plan were implemented through EDC members. The implementation was subject to issue of authorization order from the Government and release of requisite funds for the year. The micro-plans prepared in 1994 for three years were revised in 1997 and were continued till completion of the project in the year 2000.

The response of EDC members to implementation was ascertained through administering six attributes. In the six study villages, maximum number of respondents rated the success of implementation in medium category (45%) followed by high (32%) and low (23%) (Figure 31). Considering the level of agreement of the respondents to the six attributes, 62% respondents rated programme implementation as successful, 29% rated it as failure and remaining 9% were undecided (Table 36). Ninety eight percent of the respondents agreed that ecodevelopment was implemented without any bias towards any section of the society and 72% respondents indicated that ecodevelopment works on private lands were successful. Sixty five percent of respondents agreed that ecodevelopment works were executed in a regular and systematic manner but 31% disagreed. Forty seven percent of the respondents expressed the view that ecodevelopment works on community lands were successful while another 47% disagreed. Fifty two percent respondents opined that works on forest lands were successful while a 27% disagreed and remaining 21% were undecided. It is thus observed that there is a decline in success of works undertaken from private lands to forest lands and community lands. This indicates that the EDC members still felt that ownership of the asset created is of critical importance and they did not do sufficiently to ensure success of works on community and forest lands. This points to the fact that ecodevelopment interventions failed to develop the stake of the communities in public assets up to the desired extent. This can be achieved through more intensive awareness creation, consultation with EDC members and linking the ecodevelopment benefits accruing to the communities with the success of interventions on community and forest lands. The grass root forest officials also seem to consider the success of such activities as the responsibility of EDC.
members. It needs to be impressed upon them that ecodevelopment is a joint responsibility of forest department and the communities and their technical and legal support will continue to play a major role in the success of all interventions.

In the correlation analysis, ecodevelopment implementation was found to be very significantly and positively correlated with ecodevelopment planning, adequacy of the micro-plan, gender issues, ecological impact, generation of additional employment, effectiveness of executive committee and overall success of the programme. All these parameters need to be adequately addressed to ensure successful implementation of ecodevelopment.

In Sarwa, a highly significant positive correlation was found between the level of education and successful implementation of ecodevelopment programme. It appears that the respondents with lower level of education did not pay adequate attention to the successful implementation of the programme. The reason may be that with their lower land holdings, they did not feel that the programme can be of much significant benefit to them. In the regression analysis, the variation in ecodevelopment implementation is significantly explained by planning process.

Examination of Government Resolutions and personal interactions with EDC members and forest officials revealed that the implementation could be made more successful and effective by eliminating or reducing procedural delays. Though the micro-plans were originally prepared for three years, they were subsequently revised after three years and extended by another two years. An original time frame of five years at the beginning itself would have helped better planning and implementation. It would have also provided more time for undertaking confidence building measures and better consultation with the communities.

The Government resolutions for each fiscal year were issued after significant time lags, particularly for the new activities to be initiated during the year. It gave rise to an air of uncertainty which adversely affected the confidence of communities regarding seriousness of the Government in implementing ecodevelopment. There were also mid-term policy changes in 1996, 1997 and 1999 which necessitated change in the nature of inputs, adversely affecting the morale and confidence of the communities as well as the forest officials. For example, the original Government Resolution for initiation of ecodevelopment in 10 villages in 1993-94 was issued on 18-3-1994 which reached
grass-root level forest officials after the end of the financial year. The Government Resolution for continuance of the ecodevelopment in 1999-2000 was issued as later as 11.2.2000 and individual beneficiary activities were excluded. **Mechanisms need to be devised to ensure free flow of funds in accordance with the approved micro-plans if the interest of the communities in ecodevelopment is to be sustained.** Once the forest department loses the trust and confidence of the communities by not being able to undertake the activities as scheduled, the entire programme has potential to become counter-productive inviting the ire of the local communities. This issue therefore, needs handling with utmost sensitivity.

**5.2 Objective - 2**

To assess the adequacy of the management interventions

Ecodevelopment was meant to be undertaken in selected villages on the basis of micro-plans prepared by the Forest Department in consultation with ecodevelopment committee members. Technical sanction and administrative approval was to be granted by the competent authority. Such micro-plans were prepared within the overall frame work provided by the project implementation volume and government resolutions. The maximum outlay for a micro-plan was fixed to be Rs.10,000 per household and a maximum of 60 households in the village were to be enrolled as ecodevelopment committee members based on their consent. The upper ceiling for the micro-plan was thus fixed at Rs. 6.00 lakhs. Originally more emphasis was laid on creation of plantations and undertaking soil moisture conservation activities. Some provision was also available for initiating individual beneficiary activities for additional income generation. However, after the mid-term review of the project, there was change in policy guidelines and more emphasis was laid on supplementary income generation activities and creation of community assets. Individual beneficiary activities were taken out of the purview of the ecodevelopment which resulted in resentment amongst EDC members as such activities were part of approved micro-plans.

**It was found that the micro plans covered only selected village and not entire zone of influence which would have helped in implementation of ecodevelopment in a**
holistic and more scientific manner. The micro-plans should therefore be formulated in future on a cluster basis after ascertaining the zone and level of influence of the community on the forests.

The financial outlay of Rs. 6 lakhs was found to be too low to have any meaningful ecodevelopment impact which could be ascertained over a period of time. This financial ceiling needs to be withdrawn and the micro plan should be prepared on the basis of the ecological and socio-economic requirements of the selected cluster of villages.

The project envisaged involvement of a maximum of 60 households as EDC members. This limit was found to be arbitrary and divided the selected village into two groups i.e., EDC members and non-EDC members. Such a situation sometimes leads to conflict of interests in the community as non-ecodevelopment committee members had no stake in the success of ecodevelopment. The ceiling of 60 members of ecodevelopment committee members should be withdrawn and all households in the village who voluntarily agree to participate in the ecodevelopment programme should be included. In case of large population, the EDC membership should be decided based on the level of dependence of the households on forest resources. In the household survey, 59% respondents agreed that the micro-plan was adequate in terms of extent and cost to meet the objectives of ecodevelopment. Twenty percent respondents disagreed and 21% were undecided.

The micro-plan only superficially addressed the training needs assessment of grass-root forest officials, the EDC members, the executive committee members and the beneficiaries who were provided supplementary income generation assets. A detailed training needs assessment is required to be carried out while formulating the micro-plan with adequate inbuilt flexibility. The individuals or organizations competent in imparting trainings to the trainees also need to be identified in advance.

Forward and backward linkages should be provided for supporting income generation activities to ensure success of such initiatives. Detailed schedule need to be provided in the micro-plan for formal and informal interactions with various stake holders including forest officials, EDC members, NGOs, technical support groups and other government department officials.

Gender and equity issues need to be examined while preparing the micro-plan and they need to be adequately addressed. Institutional, financial and silvicultural sustainability
aspects of ecodevelopment need to be addressed while formulating the micro-plan and the role of all the stake holders in ensuring sustainability needs to be clearly defined and understood.

Ravindranath and Sudha (2004) have also reported that under the Joint Forest Management (JFM) programme in India, micro-plans have been prepared largely without community involvement and in some cases with their partial involvement. The micro-plan did not adequately deal with resource inventory, biomass production estimate, community requirement and management prescriptions that need to be followed for the sustainable use of forest resources, particularly NTFPs. Thus the micro-plans have become mere documentary proof of existence of JFM under the current situation. The micro-plans are often written and executed by the forest department staff and villagers are not aware of the contents of the project in many cases.

Peace Institute (2004) while reviewing the India Ecodevelopment Project, also suggested that full coverage of the impacting villages should be ensured, as this is critical for achieving project objectives and consolidating its gains. In situations where full coverage is not possible, mechanisms need to be developed by which preference in selection goes to villages that have greater impact upon the PA and to those villages which have predominantly poor population. The report also indicates that though the SAR stipulated that micro-plans be jointly prepared by forest department personnel and NGOs/NGIs, the only PAs that were able to follow this stipulation were Periyar and Kalakkad Mundanthurai Tiger Reserve.

5.3 Objective - 3
To assess the impact of the village ecodevelopment on conservation of forest and wildlife in the protected areas

5.3.1 Ecological Impact – Response of EDC
Household survey was conducted as part of the study to ascertain the ecological impact of ecodevelopment programme. Based on the eight identified attributes, the response of selected EDC members to these attributes and categorization into low, medium
and high classes on the basis of mean and standard deviation, about 37% respondents rated the ecological impact as medium, 34% as high and 29% as low (Figure 31). Eighty three percent of the respondents agreed with the eight identified attributes of ecological impact, 7% disagree and the remaining 11% were undecided (Table 36). Ninety six percent respondents agreed that ecodevelopment has helped in reducing their dependence on forests for grazing of cattle, fuelwood, small timber and NTFPs. Ninety five percent respondents were of the opinion that ecodevelopment has helped the villagers to understand the need for conservation of forests and wildlife in a better way. Ninety one percent respondents felt that the quality of forests has improved after ecodevelopment. Eighty seven percent respondents mentioned that wildlife population around the village has increased. Sixty nine percent respondents have mentioned that soil and water conservation works have been effective. Fifty nine percent respondents felt that plantations and soil and water conservation works have improved the water table. Eighty percent respondents indicated that collection of NTFP from forests has decreased after ecodevelopment. Eighty eight percent of the respondents were of the view that ecodevelopment has resulted in reduction of illicit felling of trees and unauthorized grazing.

These responses indicate that EDC members overwhelmingly felt that ecodevelopment has made a significantly high impact on the ecology of the forests. Though these are only the perceptions of the communities and not backed by detailed scientific studies for quantification of the positive changes, they do indicate a definite improvement in the ecological status prevailing before the start of ecodevelopment. It may also not be scientifically feasible to quantify all these positive changes as the project area was quite small and the project period too short to enable quantification of these changes.

In the correlation analysis, ecological impact was found to be significantly and positively correlated with ecodevelopment planning, ecodevelopment implementation, maintenance of assets and overall success of ecodevelopment. Ecological impact was, however, found to be highly negatively correlated with social participation which shows a disturbing trend that increased social activities are presently having negative impact on the ecology. **It is therefore, essential to transform these social platforms into forums for improving the cooperation and awareness about ecological conservation amongst the**
communities. The factors contributing to such negative developments also need to be understood and addressed.

In Munawale, a highly significant positive correlation of ecological impact with ecodevelopment implementation and gender issues clearly indicates that by paying proper attention to these two aspects, the overall ecological impact has been positively influenced.

In village Mandur, a positive correlation between ecological impact of ecodevelopment and the realization that unemployment is the major reason for forest degradation points that the villagers seem to realize the benefits that improvement in the ecological status of the forest will bring to them, yet they were forced to indulge in forest degrading activities for the sake of earning their livelihoods. Providing alternate livelihood options to the villagers appears to be a very strong factor in enlisting their participation in ecological improvement activities.

The regression analysis indicates highly significant negative contribution of additional employment generation in explaining the variation in ecological impact. It indicates that unemployment or inadequate employment in the communities is making a negative impact on the ecology. The forest department and EDC is therefore, required to find ways and means for providing gainful employment to wean people away from causing negative impact on the ecology. This is critical for the success of ecodevelopment. Linkages need to be developed with other government departments, private sector and industries for improvement of employment opportunities. This will also necessitate capacity building and upgradation of skills for which detailed programme is needed to be chalked out. The district administration has to play an important role in this venture.

Ravindranath and Sudha (2004) have also reported that the vegetation status under JFM in the country has improved considerably, compared to pre-JFM times, although the impact on biodiversity has not been pronounced. There has also been a reduction in the illegal timber and fuelwood due to the protection measures adopted by the community in most of the JFMCs. Besides an increased availability of fuelwood, the shift to alternative fuels such as biogas, crop residue and LPG also ensured that women’s toil has reduced. In West Bengal and Gujarat, communities reported an increase in the water table in the wells adjacent to the forests in the JFM areas.
5.3.2 Species Richness

On comparison of the number of species in project and non-project forest areas, it is found that the number of tree species was higher in project forest area (65) in comparison to non-project forest area (44) in 12 tree quadrats each. The number of shrub/seedling species was also higher in project area (75) in comparison to non-project area (65) in 24 shrub/seedling quadrats each.

The vegetation in the project forest area was studied in more detail. In the 10 tree quadrats each in the project area of six individual study villages, the richness of species in terms of number was found to be highest in Sarwa (44) followed by Mandur (40), Borbet and Munawale (31 each) Kalambha (27) and the number was lowest in Kondhwal (17). Considering shrubs and seedlings in the project area (20 quadrats in each village), their number was highest in Mandur (58) followed by Sarwa (44), Munawale (36), Borbet (33), Kondhwal (11) and Kalambha (4).

The Margalef’s index of species richness for trees was found to be higher in project forest area (10.69) as compared to non-project area (7.15). Likewise, the Margalef’s index of species richness for shrubs/seedlings was found to be higher in project forest area (13.4) as compared to non-project area (11.71). In case of tree species in the project area of six individual study villages, Margalef’s index was found to be the highest in Mandur (7.24) and lowest in Kondhwal (3.71) (Table 14).

Therefore, based on the species number and Margalef’s index, it is concluded that species richness of trees as well as shrubs/seedlings was higher in the project forest area as compared to non-project forest area. It is interesting to note that Margalef’s index was more for shrubs/seedlings as compared to tree species in both the categories of forest areas i.e. project as well as non-project forest area. It was therefore concluded that ecodevelopment programme has contributed positively towards increase in species richness.

Another important finding was that the project area had lower stem density of trees but higher stem density of shrub/seedlings. This indicates that ecodevelopment programme has augmented regeneration in the project area.
5.3.3 Species Diversity

The species diversity increases as Shannon-Wiener index increases. The Shannon-Wiener index of species diversity for trees was found to be higher in project forest area (3.1207) as compared to non-project area (3.0531). Likewise, the Shannon-Wiener index of species diversity for shrubs/seedlings was found to be higher in project forest area (3.7778) as compared to non-project area (3.6776) (Table 15).

In the individual villages in the project area, Shannon-Weiner index for tree species was highest in Mandur (3.09) and lowest in Borbet (1.78). For shrubs and seedlings, the index was highest in Mandur (3.70) and lowest in Kalambha (1.24) in the project area (Table 18).

The species diversity decreases as Simpson’s index increases. The Simpson index of species diversity for trees was found to be lower in project forest area (0.0578) as compared to non-project area (0.0737). The Simpson index of species diversity for shrubs/seedlings in project forest area was slightly lower (0.0368) and was found to be slightly higher in non-project area (0.0382) (Table 15). In the project area of individual villages, Simpson index for tree species was found to be the highest in Borbet (0.32) and lowest in Munawale and Mandur (0.06 each). Considering individual study villages in the project area, Simpson index for shrubs and seedlings diversity was highest in Borbet (0.32) and lowest in Mandur (0.03) (Table 18).

The Shannon-Wiener and Simpson indices of species diversity, which takes into account both abundance and evenness of the species, indicate that the species diversity was found to be higher in the project forest areas as compared to non-project forest areas for trees as well as shrubs/seedlings. It was therefore concluded that ecodesvelopment programme has contributed positively towards increase in species diversity. It is also interesting to note that species diversity was more for shrubs/seedlings as compared to tree species in both the categories of forest areas i.e. project as well as non-project forest area.

5.3.4 Vegetation Change Based on Satellite Data Interpretation

It has been found that over a period of 7 years between 1993 and 2000, there has been a net increase in the forest area in Kalambha (34.52 ha), Kondhwal (150.38 ha) and Borbet (30.16 ha). Also, net loss in forest area was noticed in Sarwa (3.86 ha), Munawale
(13.78 ha) and Mandur (7.08 ha). Overall an increase of 190.36 ha was assessed across the six study villages over a period of 7 years (Table 22). As per the χ² test, Kondhwal village exhibited significant change in the forest area. The change in other villages was found to be non-significant (Table 20). Overall it indicates that ecodevelopment has made a positive impact on the vegetation of the forests.

5.3.5 Change in the Status of Forest Offences

Preliminary Offence Report (POR) data of the forest department for the period 1994-2000 reveals that there has been no significant increase or decrease in the offences pertaining to illicit cutting of trees, forest fires and unauthorized grazing (Tables 21 to 23). The impact of ecodevelopment initiatives may be more perceptible over a longer time-frame when the plantations reach harvestable stage. The overall quantum of the booked offences has been low, though the possibility of offences going undetected or unrecorded cannot be ruled out.

5.3.6 Change in the Status of Wildlife

In Kalambha village, the perception of the forest department is that the sightings of the barking deer, wild boar, rabbits and leopard have been reported. In Sarwa village, the forest department has not reported any wildlife sighting. No perceptible change in the status of wildlife was noticed in Kondhwal. In Munawale, the forest department has reported the sightings of barking deer, wild boar, sambhar, and porcupine. Indian gaur sighting was rare. In Mandur, the forest department has reported increase in the sighting of Indian Gaur. The cases of cattle killings by leopard also increased. Leopards were sighted occasionally. The forest department has reported the sightings of Indian gaur, barking deer, wild boar, sambhar, mouse deer, fox and wild dogs in Borbet.

As part of the household survey related to ecological impact, 87% of the respondents in the six study villages have strongly agreed or agreed that the population of wild animals around the village has increased after ecodevelopment programme. Eleven percent respondents were undecided and remaining 3% disagreed (Table 36). Considering village wise response, agreements regarding increase in wildlife population was 89% in Kalambha, 100% in Sarwa, 100% in Kondhwal, 45% in Munawale, 88% in Mandur and 100% in Borbet (Table 30-35). Overall, it can be inferred that ecodevelopment has made positive impact on wildlife population in the vicinity of the study villages.
5.4 Objective - 4
To assess the impact of the ecodevelopment on providing forest based resources from outside protected areas

With a view to reduce the dependence of the local communities on the protected areas for forest based resources, provision was made in the micro-plan for raising plantations on village community and private lands. The EDC members were allowed to cut grasses from community plantations for meeting their domestic needs and also to sell it to generate revenue for the ecodevelopment fund.

Available community lands were planted by EDC members. In Sarwa, a small area of 0.84 ha planted in 1994-1995 had a survival of 69% in 1999. In Kalambha, 1.98 ha land was planted. In Borbet, 30 ha community land planted in 1995-96 had a survival of 70% in 1999. In Kondhwal, Mandur and Munawale, available community land was either too meager or it was not planted. Private land of 20 beneficiaries admeasuring 20.68 ha was planted in Sarwa in 1995-96 but the survival of 15% in 1999 was found to be very poor. In Kalambha, 45.50 ha private land of 25 beneficiaries was planted in 1994-95 and survival was 25% in 1999. In Mandur, 60 ha private land of 60 beneficiaries was planted in 1994-95 with a good survival of 77% in 1999. Fifty hectare land of 50 beneficiaries planted in Munawale was having a survival of 59% in October, 1999. In Borbet, 80 ha land of 13 beneficiaries was planted in 1995-96 with a survival of 70% in May, 1999. In Kondhwal, no private land was planted. Most of the plantations were taken on the bunds of the agricultural fields with few block plantations on private wastelands.

During field study in these villages during 2003-2008 and interaction with EDC members and forest officials, it was found that these plantations on community and private lands have not been monitored after the end of the project in the year 2000 as no such guidelines were issued under the ecodevelopment programme. However, it was noticed that such plantations are generally better than those raised on forest lands. The overall survival was found to vary from poor to average. It was found that generally, there was no shortage of fodder grass and the villagers were cutting grass from private areas as well as community plantations. There was no tendency to store fodder grass or sell it for earning revenue. The plantations raised on community and private lands are not mature enough at present to yield small timber or NTFPs. However, in due course of time, some of such
needs are likely to be met through these plantations. However, it was found that in some villages like Munawale and Borbet, there was a potential to cover more community areas under plantations. Necessary modalities need to be worked out for maintenance of community plantations and usufruct sharing.

Supporting activities were undertaken in Kalambha to meet the energy needs of the EDC members. Stove and pressure cookers were supplied to 52 beneficiaries and smokeless chullahs were provided to 87 beneficiaries. Similarly, biogas, fuel-efficient stoves, smokeless chullahs and pressure cookers were also supplied in Sarwa.

Overall, it is noticed that a small but significant beginning was made to provide forest based resources from outside the protected areas and reduce the dependence of EDC members on forests for meeting their energy needs. The magnitude of this intervention needs to be increased and sustainability aspects of community plantations need to be addressed.

5.5 Objective - 5
To assess the impact of the ecodevelopment on improvement of socio-economic conditions of the villagers

5.5.1 Social Participation
A critical component of all community based conservation programmes is to involve all the strata of the society and address all their specific needs. This requires a high level of understanding, free flow of information and trust in positive intentions between the community and forest department. Inter-community differences also need to be addressed and conflicts sorted out amicably if the active participation of all the sections of the community is to be ensured. Traditionally, an average villager is busy toiling to address his household’s livelihood requirement. It, therefore, needs lot of understanding, skill and expertise to ensure his participation in social events.

The level of social participation of EDC members was ascertained through the change in the number of social events being attended by them. Overall, 60% respondents rated social participation as low, 21% as high and 19% as medium (Figure 31). It indicates that more efforts are required to be made to ensure better participation of all the members of the community in social events. Formal as well as informal meetings of EDC
could be organized more frequently. Short audio-video programmes addressing the ecological, agricultural, educational and income supplementing requirements could be organized to promote better interaction amongst the community and also with forest and other government officials.

In the correlation analysis, social participation was found to have strong negative correlation with ecodevelopment planning, ecodevelopment implementation, effectiveness of executive committee, ecological impact, maintenance of assets and adequacy of micro-plan. This reveals a highly disturbing trend that social events have not been able to promote ecodevelopment. Rather, they have caused a negative impact. It appears that presently these social events are merely being used to air grievances of the community against ecodevelopment interventions rather than playing a positive and constructive role in undertaking suitable corrective measures to ensure success of ecodevelopment. This also indicates weakness or lack of leadership in such community events which has failed to satisfy doubts of the community and drive home usefulness of ecodevelopment for the benefit of individuals and community.

Urgent measures are therefore needed to be taken to ensure more frequent meetings, providing creative leadership, devising channels for addressing suggestions and grievances of EDC members and initiating measures to improve trust in the usefulness of ecodevelopment.

The study of correlation matrix in village Kondhwal reveals that the education level and social participation are negatively correlated. As the education level goes up, it was found that participation of villagers in social events like village panchayat meetings, EDC meetings and ExC meetings has decreased. This indicated that better educated people have the tendency not to attend such social gatherings and it is left mostly to the less educated people to attend such event. This points to a disturbing and undesirable trend as non-participation of educated villagers will not only alienate them from village community but also will deprive them from making contributions towards various decision-making processes during such meetings. The village is also deprived of the benefit of the wisdom and suggestions of educated class in resolving various issues in such congregations.

In Munawale, an increase in social participation is not accompanied by an increase in awareness regarding gender related issues and these coefficients are negatively
correlated. It indicates that the social meetings have mostly been attended by men. In the regression analysis, the variation in social participation is significantly explained by gender issues, ecodevelopment planning, asset maintenance and employment generation. These four parameters need to be especially addressed if the community congregation is expected to contribute positively to ecodevelopment.

5.5.2 Gender and Equity

Gender and equity issues need to be carefully addressed to ensure the success of any ecological or rural development intervention. The ecodevelopment programme in Maharashtra envisaged participation of 60 households in a village without discrimination between male and female members. It also provided for two female members in the executive committee. The impact of ecodevelopment in addressing gender issues was found to be medium with 32% respondents rating it as low, 34% respondents as medium and 34% as high in the six study villages (Figure 31). Traditionally, rural women in India generally do not actively participate in social activities, particularly in the activities which are being initiated by external organizations. No provision was made either in the Government resolutions or the micro-plan for making special efforts to elicit their participation in ecodevelopment. Local women teachers and anganwadi workers would have provided an effective interface between the forest department and village women to more actively involve them in ecodevelopment. It is essential to treat women as a group with specific needs and roles to perform in ecodevelopment rather than addressing their needs as a general category of villagers.

In the household survey, it was found that 60% of the respondents felt that the village ecodevelopment committee had adequate representation of women. Though women participated in various ecodevelopment activities, it is seen that most of the members registered with the forest department are men. It indicates the need for gender sensitization of the male members of the community and a gender sensitive approach by the forest department.

Women’s participation as EDC members was best in Kondhwal where 22 out of 100 members were women. In other villages, women had only a token representation. In Kalambha, 3 out of 102 members were women. In Munawale 6 out of 98, in Mandur 6 out of 105 and in Borbet 2 out of 38 members were women. Thus, barring Sarwa, for which
data were not available, it was found that women’s overall representation in the ecodevelopment committee was only 9 percent (39 out of 443). According to Census of India, 2001, the sex ratio (females per 1000 males) was 961 in Kalambha, 917 in Sarwa, 1127 in Kondhwal, 1007 in Munawale, 1067 in Mandur and 924 in Borbet with an average sex ratio of 1000. Judging by the ratio, 50% of the committee membership should have gone to women. This calls not only for suitable policy decision at Government level but also sensitization of male communities and forest department officials. Conservation of forest resources is intricately linked with the livelihood sustenance needs of rural women and therefore necessary measures need to be taken to improve the involvement of women in all the stages of ecodevelopment.

The government policy stipulated for inclusion of two women as members of the executive committee. However, it was found that in the six study villages, the total number of women members was 12 out of 81 (15%). It indicates that efforts were made to have women representation in the executive committee wherever possible except in Munawale which had no woman member. Kalambha had 3 woman executive committee members out of 10, Kondhwal 2 out of 9, Sarwa 1 out of 10, Mandur 4 out of 25 and Borbet 2 out of 15.

Success of a community based programme like ecodevelopment is closely linked to involvement of all the strata of the society in all the activities. The role of the disadvantaged segments of the society like scheduled castes, scheduled tribes and other backward castes (OBC) in achievement of ecodevelopment objectives is, therefore, critical. Census of India, 2001 indicates that the proportion of SC population was 1.4% in Kalambha, 6.1% in Mandur and 32.9% in Borbet. The remaining three villages had no SC population. The profile of the ecodevelopment committee members reveal that 1% of member in Kalambha, 4% in Mandur and 98% members in Borbet were scheduled castes.

The proportion of ST population as per Census of India, 2001 is 47.3% in Kalambha 4.8% in Sarwa, 95.6% in Kondhwal, 0.5% in Mandur and 3.3% in Borbet. Membership of ecodevelopment committee indicated 44% members of ST in Kalambha, 100% in Kondhwal and 1% in Mandur (Annexure I). The forest department has thus taken due care to provide adequate representation to SC and ST in ecodevelopment committees. As regards OBC members in EDC, 56% members in Kalambha, 5% in Munawale and 2% in Mandur were OBC.
As regards the executive committee, Government Resolution stipulated one member each representing SC, ST and OBC in the Committee. It was found that out of a total of 72 members (except Kondhwal), 5 were SC, 1 was ST and 24 were OBC. Ravindranath and Sudha (2004) while assessing the spread, performance and impact of joint forest management in India, have reported that empowerment of women was perceived largely in tribal-dominated areas in the country, although not to the desirable extent at the state level. Women were active in those JFM committees that had functioning and effective Self-Help Groups (SHGs).

Pandey (2008), realizing that women are poorer of the poorest in the buffer zone of the Great Himalayan National Park (GHNP), organized these women folk of natural resource dependent households into small Women Saving and Credit Groups (WSCGs) for saving their money (one rupee a day) and earn credits within WSCG to invest money in natural resource based enterprise development. The WSCG has proved to be an important institution striving to promote an equitable access to natural resources and supporting social/environmental justice and gender sensitivity. The apex body of WSCGs, called Society for Advancement of Hill and Rural Areas (SAHARA), provides continuity and mass support to biodiversity conservation.

The consultancy report of Peace Institute (2004) indicates that compared to the parameters set out in Staff Appraisal Report (SAR) of World Bank funded India-Ecodevelopment Project (IEDP), the actual impact of the project on women has been largely unimpressive barring three sites, namely Periyar Tiger Reserve, Kalakkad Mundanthurai Tiger Reserve (KMTR) and GHNP. The study revealed that gender concerns were reflected very weakly in IEDP. It suggested addressing gender concerns effectively and weaving them into ecodevelopment strategies by reversing the community mobilization efforts by first promoting sub-village level institutions like women’s SHGs and forming village level institutions like Eco-development committees only at a later stage.

In the household survey, 60% of the respondents felt that ecodevelopment committee had adequate women representation, 53% opined that issues related to women welfare were adequately addressed, 55% felt that women played active role and 63% respondents mentioned that ecodevelopment helped the women to unitedly project their requirements.
In the correlation analysis, the gender issues were found to be highly significantly and positively correlated with ecodevelopment planning, ecodevelopment implementation, generation of additional employment, effectiveness of the executive committee, adequacy of the micro-plan and the realization that unemployment is one of the main reasons for forest degradation. These parameters need to be made gender sensitive to ensure that the needs of women are properly addressed to enable them to play a more effective and constructive role in ecodevelopment.

In village Mandur, a significant positive correlation between the gender issues and adequacy of management interventions during ecodevelopment programme indicates the perception of the villagers that addressing gender issues appropriately was one of the main reasons for finding the programme adequate. In other words, the villagers strongly felt that without addressing the gender related issues, the management interventions made in the ecodevelopment programmes would not be holistic and show desired results.

5.5.3 Maintenance of Assets

The respondents were asked to indicate as to whether they were able to maintain the assets like plantations, earthen bunds, biogas plants etc after the end of the programme. 93% respondents have replied in the affirmative, 3% have replied in the negative and the remaining 4% were undecided. According to the categorization done on the basis of the mean and standard deviation across the six villages, it was found that 69% of the responses belonged to high category and remaining 31% responses belonged to medium category. However, during the field studies in the selected villages and collection of data on the status of the assets created, it was found that the level of maintenance, in general, was poor. This may be because of the fact that the contribution made by the community towards ecodevelopment fund was quite minimal and therefore, enough funds were not available for maintenance of these assets after completion of the project period. Apart from the EDC and executive committee, which were basically constituted for implementation of ecodevelopment during the project period, no institutional mechanism was devised to ensure maintenance of the assets beyond the project period. This issue needs to be addressed on priority basis to ensure continuity of ecodevelopment after withdrawal of government machinery and cessation of government funding.
In the correlation analysis, maintenance of assets was found to be significantly and positively correlated with the ecodevelopment fund and improvement in unity and understanding amongst the villagers. However, this parameter was found to be negatively correlated with social participation, gender issues, employment generation and adequacy of the micro-plan. During the visits to the project areas and informal discussions with the EDC members, it was noticed that, by and large, the community was expecting the forest department to continue to maintain the community assets for them and they were psychologically and technically not geared up to assume this responsibility after the project period. This responsibility is required to be impressed upon them during initiation of the project. Their technical capabilities are required to be improved and adequate funds are to be ensured after the project period to improve the level of maintenance of the community and individual assets.

In village Mandur, positive correlation also existed between creation and operation of ecodevelopment fund and maintenance of the assets created during the programme after the end of the programme period. This perceived notion of the respondents does not appear to be correct as negligible amount has been deposited in the fund by the EDC members during and after the implementation of ecodevelopment plan and the deposited amount is not adequate enough to ensure maintenance of the assets.

In village Borbet, a significant positive correlation between ecodevelopment fund and maintenance of the assets indicates the perception of the villagers that creation, operation and utilization of ecodevelopment fund and their regular contribution to it will result in better maintenance of various community assets in the villagers. However, actually the contribution of villagers to the fund was found to be negligible and the perception did not translate into reality.

5.5.4 Unity and Understanding amongst Villagers

One of the prerequisites for the success of any community based conservation initiative is to facilitate unity and understanding amongst the villagers. This not only provides congenial atmosphere for implementation of the conservation initiatives but also ensures that the community takes over the responsibilities of continuing the programme after withdrawal of the government machinery. This influences the sustenance of the conservation programme beyond the project period. The level of unity and understanding
amongst the villagers was assessed through administering 4 attributes. Eighty nine percent of the respondents have agreed that the unity and understanding amongst the villagers improved because of the ecodevelopment, 4% respondents disagree with this and 9% were undecided. Eighty nine percent respondents have indicated that ecodevelopment has helped in organizing the village meetings more frequently. Eighty eight percent respondents felt that the understanding between forest department and the villagers improved after the initiation of the ecodevelopment. Eighty five percent respondents also indicated that the visits of forest officials to the villages increased during and after initiation of ecodevelopment (Table 36). Based on the mean value and standard deviation, it was noticed that 44% of the respondents have rated the success of the ecodevelopment programme positively influencing the unity and understanding as high. Thirty three percent respondents have rated it as low and the remaining 23% have rated it as medium (Figure 31). Overall, it is found that the ecodevelopment has significantly improved the communication and understanding amongst the members of the community as well as with the forest officials. This process is not only required to be continued but also strengthened as it is critical for the success of the ecodevelopment initiatives. As suggested earlier, more theme based meetings and capacity building programmes are required to be held during and after the project period.

In Munawale, a highly significant and positive correlation between improvement in unity and understanding of villagers and improvement in employment generation due to the ecodevelopment programme indicates the perception of the villagers, that if they are united and work toward a common goal, they may be able to improve the employment potential for themselves.

In the correlation analysis, improvement in the unity and understanding of the villagers as a result of ecodevelopment was found to be positively correlated with ecodevelopment fund and negatively correlated with annual income, ecodevelopment planning and adequacy of micro-plan. This indicates that to improve the cohesiveness in the community, they are to be more intensively involved during the planning stage and also their suggestions and requirements need to be considered in the micro-plan. Additional employment generation activities also need to taken.
5.5.5 Unemployment as a Cause of Forest Destruction

It is well established that the rural communities depend on the forest resources for their livelihoods. In the event of no adequate alternative being available to the villagers, they resort to illegal removal of timber, firewood and NTFPs from the neighbouring forests. This causes severe degradation of the forests; unauthorized removals are obviously not based on scientific principles of sustainable harvest. An attempt was made to ascertain as to how much is the impact of unemployment on forest destruction. Seventy three percent of the respondents agreed that some of the villagers are involved in unauthorized activities in the forests only for want of other alternative livelihood opportunities. Based on the mean and standard deviation, it was found that 57% of the respondents considered the impact as high, 29% as low and the remaining 14% as medium (Figure 31). It is therefore, essential to conceive programmes and activities for providing the rural communities gainful employment to earn their livelihoods. The forest department and the executive committee need to undertake skill improvement activities and develop channels of liaison with various employment providing agencies.

5.5.6 Employment Generation

One of the main objectives of the ecodevelopment was to reduce the dependence of the rural communities on forest based resources by providing them access to supplementary income generation activities. Fifty percent of the respondents have agreed that the ecodevelopment initiatives have helped in generation of additional employment and a substantial 39% have mentioned that ecodevelopment programme has failed to do so. Thirty nine percent of the respondents have mentioned that the trainings were not very useful and they have failed to result in generating additional income. Based on the mean and standard deviation, 41% of the respondents have indicated that ecodevelopment had medium impact on the income generation, 30% have indicated low impact and the remaining 29% have found the impact to be high (Figure 31). Providing the community means of supplementary income generation is crucial to wean the villagers away from destruction of forests for earning their livelihoods. It is therefore necessary to identify supplementary income generation activities, carefully based on the liking and priority of the villagers and to develop suitable market linkages. The beneficiaries are to be properly trained to adopt the vocation of their choice, which, in turn, should be based on the market dynamics. Backward integration in terms of supply of raw material, equipment and
arrangements for micro-finance by developing tie-up with banks would provide backdrop essential to ensure generation of supplementary income. It was noticed that the level of funding for procurement of income generating assets was very low and only a few beneficiaries were chosen in each village. This activity needs to be scaled up to reduce their dependence on the forest based resources.

In correlation analysis, the additional employment generation due to ecodevelopment programme was found to be positively correlated with gender issues, ecodevelopment planning, ecodevelopment implementation, effectiveness of the executive committee, adequacy of the micro-plan and overall success of ecodevelopment. It was however, found to be negatively correlated to maintenance of assets and land holding. In the regression analysis, the variation in employment generation was very significantly but negatively explained by land holding and asset maintenance. It was positively explained by gender issues, ecodevelopment planning and implementation.

In village Borbet, a significant negative correlation between social participation and employment generation indicates that **with higher level of interaction at various social events, the villagers increasingly realized the limitations of the potential of ecodevelopment programme in additional employment generation**. This also points to some extent of disillusionment of the villagers with the employment generating potential of the programme with higher level of awareness and interaction amongst the villagers. This finding assumes importance in the light of the fact that unemployment was found to be one of the prime reasons for degradation of forests (Table 61).

In village Borbet, a highly significant negative correlation between maintenance of assets and additional employment generation indicates that the villagers were of the view that the additional employment generation potential through use and maintenance of the community assets like plantations, provision of equipments and tools, trainings etc is very limited.

In village Borbet, a highly significant positive correlation between additional employment generation and adequacy of the micro-plan points to the fact that the villagers felt that adequate employment potential could be generated while the implementation of activities in accordance with the micro plan was in progress. It is significant to note here that, as stated earlier, the villagers do not feel that maintenance of such assets after the end of programme period will yield substantial employment as these two variables are
negatively correlated. This clearly indicates that the activities undertaken in ecodevelopment programme did not have a long term employment creation potential for the villagers in the absence of which the villagers are again likely to revert to forest degrading activities like unauthorized felling of trees, collection of NTFP, etc. once the programme has ended. Future programmes should therefore look at capacity building and long term employment generation activities and inputs. This view is further strengthened by the significant positive correlation between maintenance of assets and unemployment being the main reason for forest degradation. This indicates maintenance of assets should be able to yield additional employment generation opportunities as unemployment was found to be the main reason for forest degradation.

5.5.7 Effectiveness of Executive Committee

A high number of respondents (90%) found the executive committee to be effective in taking decisions. The executive committee was expected to take day to day decisions to ensure success of ecodevelopment programme based on the approved micro-plan. During interaction with EDC and executive committee members and also with the forest officials, it was found that the executive committee could have been more effective had certain additional measures been taken. The executive committee was not granted any special autonomy and it was dependent on the forest department for release of funds for initiation of new and maintenance activities. A small revolving fund with the executive committee could have helped to continue certain urgent maintenance activities lying pending for approval from the government and thus improve the rate of success.

Though the executive committee members were directly responsible for ecodevelopment activities, they were not imparted any orientation training as a result of which there was a lack of understanding amongst some of the executive members regarding their role, duties and responsibilities. They also lacked any formal authority to ensure effective ecodevelopment implementation and they were required to bring all relevant matters to the notice of the forest department for further action. A standard resolution may be adopted by EDC for functionally authorizing the executive committee to take certain decisions to ensure success of ecodevelopment initiatives. Such an empowerment will not only make the executive committee more effective but also the members will develop a feeling of responsibility. Presently there is no mechanism in
place regarding continuing ecodevelopment after completion of the project period. The existing government policy is silent in this aspect except mentioning that it will be the responsibility of the executive committee. The role of the committee and modalities need to be clearly defined to ensure the continuation of ecodevelopment beyond the project period and maintenance of assets created under the project.

In village Borbet, a highly significant negative correlation between implementation of the ecodevelopment programme and effectiveness of the executive committee points to the disturbing fact that the executive committee was not perceived to have contributed significantly towards the achievement of ecodevelopment objectives by implementing the ecodevelopment micro-plan. One reason for this negative feedback could be the lack of leadership and initiative by the executive committee members. Another reason may be improper selection of the members of the executive committee and without adequate consultation within the EDC which resulted in less capable and competent individuals getting elected as members. The third reason may be that the executive committee was imposed on the EDC by the forest department without adequate consultations.

5.6 Objective - 6
To assess the sustainability of the ecodevelopment after the project period

The ecodevelopment initiative is an important tool for forest and wildlife conservation through community participation. The sustainability issues attain critical significance in ensuring that the community involvement continues after the project period. This is discussed in terms of financial, institutional, ecological and social sustainability.

5.6.1 Financial Sustainability

5.6.1.1 Ecodevelopment fund:
An ecodevelopment fund was envisaged to be created in each project village for maintenance of the assets beyond the project period. The policy envisaged that this fund will be serviced through levy of nominal charges on use of the assets by the communities, sale of produce like grass from project area and voluntary contributions.
As regards the ecodevelopment fund, it was stipulated in the Government Resolution that the micro-plans should include considerations for long term sustainability of the investments. Creation of ecodevelopment fund was one of such mechanisms. The beneficiaries were expected to contribute to the fund from part of the proceeds from the individual and community beneficiary activities undertaken during the project period as decided by the ecodevelopment committee of the village. The account for the fund was expected to be opened in a bank or post office. On examination of the available records, the details of the contribution towards the fund at the end of the project period in the year 2000 were found to be as under:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Village</th>
<th>Account Operated by</th>
<th>Amount Deposited (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kalambha</td>
<td>Chairman and Secretary, ExC</td>
<td>14425</td>
</tr>
<tr>
<td>2</td>
<td>Sarwa</td>
<td>Chairman and Secretary, ExC</td>
<td>1800</td>
</tr>
<tr>
<td>3</td>
<td>Kondhwal</td>
<td>Chairman and Secretary, ExC</td>
<td>NA</td>
</tr>
<tr>
<td>4</td>
<td>Munawale</td>
<td>Chairman and Secretary, ExC</td>
<td>800</td>
</tr>
<tr>
<td>5</td>
<td>Mandur</td>
<td>Chairman and Secretary, ExC</td>
<td>Nil</td>
</tr>
<tr>
<td>6</td>
<td>Borbet</td>
<td>Chairman and Secretary, ExC</td>
<td>900</td>
</tr>
</tbody>
</table>

It can be seen that the contribution of the EDC members towards the fund was generally meager. It was also revealed that no contribution was made by the beneficiaries towards ecodevelopment fund after the project period. Scrutiny of the records also showed that the labour input put in by the beneficiaries on their private lands were not documented by the forest department or the executive committee.

In the household survey, a maximum of 46% respondents rated the creation of ecodevelopment fund as moderately successful, 28% rated the success as low and 26% rated it as high (Figure 31). To the specific query that ecodevelopment fund has been created and is being used for the welfare of the village, 76% respondents agreed, 23% were undecided and only 1% disagreed. To another statement that the contribution of the villages to the ecodevelopment fund was adequate, 73% respondents agreed, 23% were undecided and 4% disagreed. From these responses, the creation of ecodevelopment funds appeared to be successful in meeting the envisaged objectives. However, the position was
found to be entirely different when the contribution to ecodevelopment fund account was reviewed. At the end of the project period, the closing balance was Rs. 12,670 in Kalambha, Rs. 600 in Mandur and nil in Sarwa, Kondhwal, Munawale and Borbet. Thus barring Kalambha, where the beneficiaries have voluntarily contributed their share against supply of stores, pressure cookers and smokeless *chullahs*, no significant contribution was made in any village towards ecodevelopment fund. It was observed that the supportive activities have not generated sufficient supplementary income to the beneficiaries. In isolated cases, the additional income was found to vary from Rs. 800 to Rs. 1000 per month in village Mandur. In Munawale, bee-keeping activity was initiated after the end of the project period and the income from it was found to be negligible. In Borbet, the instruments provided to augment supplementary income were found to generate additional income ranging from Rs. 100 per month to Rs. 500 per month.

Thus it is observed that the response of the community is at total variance with the ground reality. This indicates that the issue of sustenance of the fund was not correctly conceived and the villagers were not able to put the facilities provided for supplementary income generation to optimum use. Concerted effort was found lacking in adequate training of the beneficiaries and developing market linkages. The equipments were also found being used only for bonafide household purpose rather than for supplementary income generation. The executive committee was also found to be ineffective in ensuring optimum use of implements and ensuring contributions to the ecodevelopment fund.

Withdrawal of funding for ecodevelopment after the project period and lack of means of sustenance has resulted in degeneration of assets created during the project period. The community was also found to be apathetic towards maintenance of these assets and expected the forest department to help them out.

In the correlation analysis, ecodevelopment fund was found to be highly significantly and positively correlated with material possession and maintenance of assets. It was negatively correlated with land holding and the realization that unemployment is the main cause of forest degradation, which is a disturbing revelation and needs to be addressed to improve contribution of the beneficiaries to the fund.

In village Borbet, a highly significant positive correlation between the ecodevelopment fund and maintenance of the assets by the villagers after the completion
of ecodevelopment programme points to the perception of the villagers that the
contribution made by the villagers to the ecodevelopment fund has helped substantially
towards maintenance of the assets. However, the actual position was found to be at total
variance with this popular perception as the contribution of the villagers to the
ecodevelopment fund was non-significant and inadequate to support asset maintenance.

5.6.1.2 Adequacy of financial outlay:
Ecodevelopment, by its very nature, is expected to be a low financial input initiative as
it actively involves the local communities in planning, implementation and maintenance
activities. However, the initial level of investment has to be commensurate with the
ecodevelopment activities identified jointly for forest department and the community while
formulating the micro-plan. Maharashtra Forestry Project initially put a cap of 6
lakhs on each village ecodevelopment micro-plan which resulted in framing of the
micro-plan not on the basis of ecological and socio-economic considerations but on
the basis of financial ceiling. The micro-plans were, therefore, not a true reflection
of ecodevelopment requirements of the community.

5.6.1.3 Timely release of funds:
Perusal of Government Resolutions (GR) authorizing annual expenditure revealed
that they were not issued at the beginning of each financial year but quite late. The GR for
initiating ecodevelopment in villages around protected areas by the wildlife wing of the
forest department was issued as late as 18 March 1994 for the year 1993-94. Similarly the
GR through which policy changes were made in 1997-98 was issued on 20 November
1997. The continuance proposal for 1999-2000 was approved on 11 February 2000 and
even then funds were not placed directly at the disposal of Chief Wildlife Warden. Such
delays gave very little time to the field forest officials and EDC members to systematically
and scientifically implement the provisions of the micro-plan during the financial year. It
is thus essential to release adequate funds at the beginning of each financial year to ensure
successful implementation of the micro-plan.

5.6.1.4 Linkages with rural development agencies:
A large number of Government and non-government organizations are evolved in
undertaking rural development activities. The development of forest resource could have
been better linked to development of agro-forestry, horticulture, pesciculture, water
conservation, education and livestock development activities to enhance the synergies, improve overall income generation of the communities and ensure sectoral integration.

5.6.1.5 Community contribution:
The revenue generation through supplementary income generation activities was quite meager to ensure sustenance through ecodevelopment fund after the project period and the EDC members were generally apathetic towards contributions to the fund. A two pronged strategy need to be worked out to device methods of increased supplementary income generation and impressing upon the EDC members the criticality of ecodevelopment fund for financial sustainability of ecodevelopment.

5.6.1.6 Ecotourism strategy:
Protected areas in the Western Ghats of Maharashtra, with their tremendous biodiversity, have the potential to be converted into ecotourism hotspots. This potential was not explored under the project. One of the reasons was the limited extent of forest area undertaken for ecodevelopment with village as a unit.

5.6.1.7 Market linkages:
Suitable market linkages needed to be developed for sustenance of income generating activities like sewing, apiculture, carpentry and ecotourism initiated under the project. However, this issue was not addressed at all under the project.

5.6.2 Ecological Sustainability

5.6.2.1 Capacity building of EDCs:
It is essential for the EDC members to be technically and managerially capable of continuing ecodevelopment beyond the project period. Maintenance of assets and sustenance of income generating activities by the beneficiaries will necessitate adequate training and capacity building. The trainings imparted during the programme were sporadic and not well planned.

5.6.2.2 Grazing by cattle:
Though the grazing incidences in protected areas as recorded by the forest officials are negligible, adequate and nutritious fodder is required to be ensured from outside PA not only to eliminate incidences of grazing in the PA but also to increase income of the household by encouraging them to opt for improved variety of milch animals.
5.6.2.3 Improvement in ecosystem services:
Activities related to soil and moisture conservation works and drinking water have helped the PA management to earn tremendous goodwill of the communities. Such activities were perceived to have improved the regeneration and water table. The magnitude of such interventions is required to be increased manifold on landscape basis.

5.6.2.4 Alternative energy sources:
Efforts were made to provide the community alternative energy sources like biogas, improved chullahs and stoves. It needs to be done in a more systematic manner and on a much larger scale. Certain other provisions like solar lamps, LPG gas, solar cookers, tapping wind energy etc can also be considered. The beneficiaries need to be trained to maintain such facilities without external help. These measures will reduce the dependence of communities on forests for their energy requirements.

5.6.2.5 Environmental awareness and education:
Awareness and education interventions need to be made to enlighten the rural masses including children about the need for conservation and the benefits of community conservation initiatives. This aspect was found to have been ignored in the project.

5.6.3 Institutional Sustainability

5.6.3.1 Mutual trust:
One of the biggest achievements of ecodevelopment in Maharashtra has been the improvement in mutual trust and respect between the forest officials and the village communities. It has helped in inculcating a better understanding which will greatly help in conservation of forests and wildlife.

5.6.3.2 EDC and executive committee:
The ecodevelopment programme in Maharashtra provided for constitution of EDC and executive committee for implementation and continuance. However, there existed no legal instrument enabling the forest department and the community for ensuring fulfillment of their respective responsibilities. The role of EDC and executive committee is also not clearly defined in ensuring the maintenance of the assets created during the project period.
5.6.3.3 Linkages with *panchayats*:

Though the *gram panchayats* have passed resolutions supporting EDCs, their role in ecodevelopment remained peripheral. The linkages between EDC and *panchayats* need to be further strengthened and institutionalized. Overlap between the responsibilities of EDC and *panchayats* particularly in creation and maintenance of community assets need to be addressed. Improved linkages will ensure use of ecodevelopment funds for the activities having a direct bearing on conservation of forests and it will garner more support for ecodevelopment activities from *panchayat raj* institutions.

5.6.3.4 Inter-departmental coordination:

Ecodevelopment was implemented as a forest department’s initiative rather than a coordinated government programme and linkages with other governmental departments were lacking.

5.6.3.5 Constitution of Self Help Groups:

Constitution of small self help groups (SHGs) of cohesive individuals would have helped in creation of improved livelihood opportunities, particularly for women. Such self help groups were not created during the ecodevelopment programme.

5.6.3.6 Interaction between EDCs:

Presently the EDCs are not confederated at regional and state level. It resulted in absence of interaction between various EDCs which otherwise would have provided an opportunity to the EDC members in consultations and learn from others’ experiences.

5.6.4 Social Sustainability

5.6.4.1 Gender concerns:

The gender concerns are addressed up to some extent while implementing the programme. However, it was noticed that active participation of women was generally poor. More efforts are required to understand and address the specific needs and aspirations of women. Help of women motivators including lady teachers, NGOs and *anganwadi* workers may be solicited. Constitution of small woman self help groups (SHGs) or women saving and credit groups (WCSGs, as in Himachal Pradesh) will substantially empower women socially and financially.
5.6.4.2 Equity considerations:

The Government resolutions provided for adequate representation of weaker sections of the society in the executive committee. The ecodevelopment programme was found to be implemented without any bias towards any section of the society. However, their significant participation is also required to be ensured in EDCs and in income generation activities.

5.6.4.3 Rural livelihoods:

The success of ecodesvelopment significantly depends on the programme being able to address livelihood concerns. As the total outlay provide for each village was rather meager, this aspect was not accorded the attention it deserved. However, the forest department was conscious of the crucial linkages between livelihood concerns and forest conservation and some efforts were made in this direction. Such issues need to be addressed in the micro-plan on a bigger magnitude. A coordinated effort by the inter-departmental agencies can address this concern.

5.7 Factor Analysis

The factors as ascertained in the Results chapter (Table 65) are being analysed here to describe the inter-relationship between various parameters.

The first factor termed ‘institutional capability’ indicates that ecological impact is closely linked with the planning, implementation effectiveness of the executive committee and management inputs in terms of adequacy of the micro-plan. Positive ecological impact is closely linked to the overall success of ecodesvelopment. Strong leadership provided by the executive committee has made significant contribution towards positive ecological impact. This reveals that all the institutional aspects of ecodesvelopment need to be properly addressed to ensure desired ecological impact. A strong negative relationship of social participation was found with all the other parameters of the first factor. This suggests that social participation may not be a key item in determining the ecological effectiveness of the programme. The negative, though insignificant, relationship between parameters such as material possession and land holding and the first group of factors
indicates that, institutional capability is the more important than resource endowments of the participants in determining the success of the programme.

The second factor named as ‘socio-economic outcomes’ highlights the crucial link between planning process and the ability of the programme to address gender concerns as well as socio-economic opportunities. The micro-plans need to focus more on the issues related to women and creation of additional employment opportunities in a comprehensive manner as these parameters have strong bearing on the success of ecodevelopment in terms of making positive ecological as well as socio-economic impact. Maintenance of assets was found to be negatively linked with overall success and it neither addressed gender related issues nor created additional employment opportunities. Educational level and land holding had negative coefficients indicating again that richer people in the villages have made less contribution towards the success of ecodevelopment than the poorer people. This indicates that the gains that the project seeks to achieve by enhancing the social capital, is more important to people with lower endowments.

The third factor termed as ‘sustainable livelihoods’ indicates that unity and understanding has a negative coefficient which in turn reveal a very important dimension that the ecodevelopment programme has played an important role in bringing about social cohesion in the poorer strata of the society rather than the richer section.

The fourth factor is called ‘physical and human capital’. This factor was found to have negative link with ecodevelopment planning as well as overall success indicating that these two parameters did not take into account the physical and human capital. It also points out that villagers with higher affluence in terms of material possession and higher education did not influence the panning process or the overall success of ecodevelopment in a positive manner.

The fifth factor is called ‘financial resource availability’. This factor again indicates that richer people tended to ignore contributions to the ecodevelopment fund whereas for the poorer people the ecodevelopment fund formed an important dimension for the positive impact of ecodevelopment. It suggests that such funds may be important to the poor people. This is confirmed on the examination of the meager level of contributions made by EDC members to this fund. Therefore, the financial capital is required to be strengthened significantly to improve the level of success.
The sixth factor represented by a single parameter indicates that the commonly held perception that creation of additional employment in the rural areas will reduce the rate of forest degradation is not totally true as this aspect has formed only the sixth factor explaining a variation of only 7.813% in the data set. This argument is further strengthened by the fact that annual income in the sixth factor has a negative coefficient indicating that for poor people unemployment is an important dimensions but for comparatively better earning households, it does not form an important dimension. The employment generation initiatives should therefore address the poorer section of the village community rather than the entire rural community.

5.8 Objective - 7
To suggest and recommend changes in policy and management interventions in future

Based on the findings of the study, following recommendations are made for more effective implementation of ecodevelopment programme:

5.8.1 Ecodevelopment Planning and Implementation

- A village-centric approach does not address the need of implementation of ecodevelopment at a landscape level. Ecodevelopment micro-plans should be prepared for a cluster of villages considering the zone of influence, social homogeneity and administrative feasibility.

- All the households of a selected village should generally be included as EDC members. In case the population of the village is large, priority should be given to the households on the basis of their level of dependence on the forest resources.

- The ecodevelopment micro-plan should be integrated into the management plan of the protected area. Management plans are long-term, perspective plans for the scientific management of the protected areas. The ecodevelopment approach needs to be inter-woven in the management plans for landscape planning. These management plans need to provide the basis for formulation of more detailed and cluster-specific micro-plans for ecodevelopment based on consultations with local communities and other developmental agencies.
It is experienced that achieving active involvement of all the strata of the villagers in ecodevelopment in a slow and tedious process. Particularly the initial phase of ecodevelopment should not be target driven and it should be utilized for gaining confidence of villagers and understanding their bonafide forest-based needs. It is therefore suggested that ecodevelopment should be implemented in three phases. The capacity building phase of one to two years should be provided for gaining confidence of the villagers, frequent interactive meetings, understanding their needs, identifying suitable IGAs, capacity building of EDC members, executive committee members and forest officials and preparation of the micro-plan. It should be followed by implementation phase of six to eight years where the prescriptions of the micro-plan are implemented with the active involvement of EDC members. The third consolidation phase of one to two years provides for gradual withdrawal of the forest department from the scene by empowering the EDC to manage the resources and restricting the role of the forest department to providing technical guidance to EDC and managing the protected area. The total project period should be for 8 to 10 years.

The IGAs should be undertaken by providing micro-finance to the EDC members to partly contribute their share rather than through total government funding to develop a stake of the villagers. Similarly, community and individual beneficiary activities should also be partially financed by the villagers.

The village community is constituted of groups having varied socio-economic and cultural entity. Homogeneous groups should be identified/formed and their specific livelihood needs be addressed before formation of a broad-based EDC.

### 5.8.2 Financing

The micro-plans should be need based and prepared after wide consultations with the village community, NGOs and other developmental agencies. The present financial ceiling of Rs. 10,000 per household should be withdrawn but equitable distribution of financial resources with regard to individual beneficiary interventions should be ensured.

The Government is required to ensure timely release of funds for the operations as provided in the micro-plan.
Delay in undertaking the operations as provided in the micro-plan not only derails the schedule but also antagonizes the village community. The goodwill and support painstakingly created by the forest department for ecodevelopment is quickly lost. As in case of FDA, the funds should be directly placed at the disposal of the PA level federation and it should not follow the usual cumbersome channels.

At least one non-official member of the executive committee should be trained in accounting as joint-secretary and he should support the member secretary to manage the affairs of the executive committee. This will further empower and involve the village community and help sustainability.

More attention is required to be paid to creation and maintenance of the ecodevelopment fund. Strict norms should be laid and observed for ensuring contributions to this fund. The executive committee should be made responsible for this purpose. The forest department should make initial contribution to this revolving fund as seed money.

### 5.8.3 Sustainable Livelihoods

- A detailed training schedule needs to be chalked out at the planning stage for the EDC members to enable them to earn their livelihoods through various income generating activities (IGAs). These trainings will not only improve their efficiency but also ensure that the products and services meet the required standards. The trainers as well as the trainees need to be carefully selected.

- More emphasis needs to be laid on additional income generation activities. Such activities need to be undertaken on a much bigger magnitude on the fringes of the protected areas to ensure financial viability of such ventures. The issue of backward and forward linkages needs to be addressed in terms of availability of raw resource, easy-to-understand–and-use technology, technical and financial support, quality control and marketing tie-ups.

- EDC members need to be properly trained in executing various forestry and allied operations as envisaged under ecodevelopment as it will result in improved implementation of the micro-plan prescriptions, affecting their livelihoods in a positive manner.
• The forest department should strive for better liaison with other developmental agencies at the taluka and district level to aim for holistically addressing the livelihood concerns of the selected villages and related ecological and socio-economic issues.

• As the community and private lands available for ecodevelopment are scarce, efforts need to be made for intensive management of the assets created on such lands to enhance productivity and consequent increased availability of forest-based resources to the communities from such areas.

• Ecotourism holds a lot of potential for the villagers to supplement their income as they have intricate knowledge of the natural trails, flora and fauna of the area. Some EDC members may be trained to act as guides. Ecotourism should form a sub-plan of the ecodevelopment micro-plan. This, however, calls for careful planning to eliminate the possible negative impacts and capacity building of forest officials and village communities. Study tours to prominent ecotourism destinations like Periyar tiger reserve and Bandipur tiger reserve will help them in assessing the potential of ecotourism in their protected areas.

• The Chief Wildlife Warden should explore the possibility, within the framework of existing law, of selective removal of forest produce by the village community for meeting their subsistence needs from the protected areas. This will go a long way in winning the confidence and support of the community for ecodevelopment.

5.8.4 Capacity Building

• More attention is required to be paid to develop inter-personnel and communication skills of the forest officials to enable better and more meaningful interaction with the village community, NGO’s and other developmental agencies.

• The executive committee members need to be exposed to technical, managerial and human resource management skills to make them more effective in managing the day-to-day affairs of EDC.

5.8.5 Gender and Equity

• Gender and equity concerns should be addressed during all the three phases of ecodevelopment. Out-of-the-box efforts are required to be made to involve these
sections of the society if the interventions are really to succeed. Help of lady teachers, *anganwadi* workers, village elders and voluntary agencies may be taken.

- The Government Resolution should comprehensively deal with the involvement of women, SC, ST, OBC in EDC in planning, implementation and decision-making processes.
- The rural community should be empowered socially and financially through formation of Self-Help Groups, Special Need Groups and Women Credit and Saving Groups (as in Himachal Pradesh). The forest department should facilitate their activities including arranging micro-financing from financial institutions.

### 5.8.6 Institutional Support

- As per the existing provisions, the *gram panchayat* is required to pass a resolution for agreeing for the formation of EDC. However, for a more meaningful involvement of the village body and effective conflict resolution, a selected number of gram panchayat members may be included in the executive committee. In addition, the *sarpanch*, *police patil* and *talathi* may be made ex-officio members of the executive committee.
- The EDC may be federated at range and PA level for better coordination and resolution of various issues. For PA level federation, the model of FDA may be examined and other developmental agencies should be involved. This will not only give an impetus to ecodevelopment in the state but also provide better coordination and learning experience for all the stakeholders.
- Involvement of various government agencies in rural development necessitates coordination between them at district and *panchayat* levels to ensure optimum and holistic development of ecodevelopment villages.

### 5.8.7 Policy Changes

- Ecodevelopment needs to have legal support in terms of its inclusion in the acts and rules to ensure long term support of the village communities for this programme. The Participatory Forest Management (PFM) Rules, 2001 of Himachal Pradesh provide for organizing user groups at ward level and their federation into Village Forest Development Society (VFDS). A memorandum of understanding (MoU) between the stakeholders will create an atmosphere of mutual trust and
clearly indicate the duties and responsibilities of the village community and forest department.

- The policy changes during the implementation of ecodevelopment should only be made for the improvement of ecological and socio-economic aspects. Such changes should only be made after consultation with the PA level federations or else the confidence of the village communities in the intent and sincerity of the Government in ecodevelopment is likely to be eroded.

- A greater role is required to be provided to the communities in day-to-day PA management in addition to the role played by them in ecodevelopment which was largely restricted to outside PA. Such role could be in terms of undertaking habitat improvement works, patrolling, wildlife census or ecotourism. This will improve the stake of communities in ecological sustenance of the PA.