5. DISCUSSION

5.1 NATURE AND TYPE OF PROGRAMS IMPLEMENTED BY THE FDAs

The destruction of natural forests for timber, crop land, fuel wood, pasture, urbanization and commercial industry has had a profound impact on rural communities who used to have a symbiotic association with the forests. The dependency of the people on forest varies from 37 to 76 per cent (Bahuguna, 2000). Deterioration of Nation’s extensive forest cover exposed critical watersheds, accelerated top soil erosion and subsequent sedimentation of rivers and reservoirs, exacerbated flooding, and over taxed the lands natural resilience and capacity to regenerate and sustain its productive and protective functions. All government initiatives and activities to control national forests through policy instruments have often led to augur the conflict among the users and further assault on the ecosystem, rather than conservation and sustainable use. This has made a task of forest protection and their sustainable management extremely challenging and arduous (Gupta, 2006).

The Forest in the country is managed and protected solely by the Forest department with legal insulation of the forest from the people who traditionally depend on them. There has been a long history of conflict and antagonism between the forest department and the local people. Under such circumstances, there has been a paradigm shift in the forest management after the enunciation of the National Forest Policy (1988) which focused the management of forest to a more decentralized level of governance. The community based approaches practically in the Forest sector have been viewed as against the traditional top down models of policy making that historically have been prevalent since the introduction of scientific Forest Management in India.

The JFM program is now a decade old operating on the “Care and Share” principal and aiming at empowering local people as partners in the management of forest resources
besides meeting their livelihood needs. Though JFM guidelines are similar throughout India, evolution of varies with a complex networks on interrelated parameters affects the implementation of JFM programs. To sub-serve the management needs and to augment the existing forest management systems, Government of India has introduced NAP with a view to reduce multiplicity of schemes with similar objectives and to create institutional mechanisms for peoples’ participation. This NAP has been implemented through two tier systems involving FDAs and JFMCs.

The activities and functions of FDAs and JFMCs were clearly delineated towards conservation and protection of degraded forest coupled with augmenting livelihood systems of the Forest dwellers. Against this backdrop, the FDA has implemented many projects and schemes which included NAP scheme, centrally sponsored scheme and other external funded schemes and dovetailed schemes of the line departments.

The current study conducted investigation on the nature and type of schemes implemented by the FDA and other Line Departments. The study was conducted in three FDAs viz., Anamalai and Coimbatore (Western Zone) and The Niligiri (Hilly Zone). The FDAs implemented equally seven programs, 6 major schemes of centrally sponsored Projects and multifacet activities of DRDA. The implementation of various schemes with multipurpose activities were already reported in many JFM villages of Tamil Nadu (Keystone, 2010, Sreedharan 2002); Madhya Pradesh (Upadhyaya, 1997); Gujarat (Srivatsava, 1997) and also in Himachala Pradesh (Gupta, 1997).

The activities of FDA in the study area under the NAP scheme included Aided Natural Regeneration (ANR), Bamboo Plantation, Mixed Plantation, EPAs, Fencing and Preparation of Microplan, Soil and Moisture Conservation and Other Maintenance works. All these activities were implemented in the three FDAs with the budget of 445.17 lakhs against the sanctioned outlay of 779.49 lakhs during 2002 to 2007.
The study revealed that only 57% of the total sanctioned outlay was released which indicated the delayed and non release of funds to complete the works envisaged and which affected the implementation systems

A Plethora of schemes have been implemented across the country over the years for protection, conservation and sustainable management of forest resources both by central and state governments (TNFD, 2010). In the state of Tamil Nadu, the schemes like World Bank Assisted Forestry Research Education and Extension Project (FREEP), Tamil Nadu Agricultural Development Project (TNADP) and Tamil Nadu Afforestation Project (TAP) have been implemented in the recent past. These schemes have contributed significantly for the forestry development; however the project like TNADP failed to kick off due to inherent problems as the participating people had no idea where their roles were required (Perrumahl, 2010). The FREEP project aimed at full involvement of local people in biodiversity conservation and the project resulted in full participation of people in the protection of tiger reserve in spite of the absence of benefit sharing due to successful income generation activities. Similarly in the current investigation, it is found that the local people particularly the tribal communities participated in the FDA activities and benefited through benefit sharing mechanism which thus attests the earlier findings of the FREEP project. However the current study findings are different from the results of TNADP implemented in the State, wherein the people are not aware of the participation but the current study has indicated the inculcation of people centered activities in all FDAs and the people are aware of the FDA activities at least partially. Hence, this has extended enough scope of horizontal expansion and promotion across the country in general and the state of Tamil Nadu in particular.

The current study observed that a wide range of EPAs was implemented across FDAs in order to gain the people’s confidence on the project development. The EPAs were carried out only in Annamalai FDA and Coimbatore FDA. No EPA was carried out in the
Nilgiris FDA. It is evident that 581 assets were created to augment the water harvesting systems, energy saving measures, community halls, roads etc., with an expenditure of Rs.368. 58 Lakhs (Figure 6; Plate 4) Similarly, Soil and Moisture Conservation measures were created to the tune of 165 assets with a budget outlay of Rs.89.63 Lakhs (Plate 5). The EPAs formed core area of scheme implementation in other forest oriented schemes (TNFD 2010). The creation of nearly 60 waterholes as a part of activities of JFM augmented the artificial regeneration of degraded forest in Tamil Nadu (Sreedharan, 2002). Similar works were also initiated in Rajasthan under the head Entry Point Activities. One innovative scheme called “Janta Van Yojna” has also been started as a part of JFM since 1995 in Rajasthan. In this, the Village Forest Protection and Management Committee (VFPMC) undertakes plantation on forest land / community land under the technical guidance of forest department personnel as a part of entry point activity. This had facilitated direct involvement of people in implementation of various EPAs (Sud, 2002). The TAP scheme implemented in Tamil Nadu with an outlay of Rs.499.20 crores have created major EPAs and wide range of assets have been created in 105 villages with the involvement of local people. More than 20 NGOs were involved for these activities. Through the program, nearly 76 percolation ponds were created to augment the Soil and Water conservation status (Gunasekaran, 2002). All these activities and programs lend support to the findings of current investigation on asset creation in the study sites.

The nature and type of EPAs are decided by the villagers themselves in association with Forest Department which are mostly in tune with the people’s requirement in the NAP Villages. The EPA included provision of drinking water, deepening and desilting of irrigation channels, construction of roads, compound walls, thrashing floor, erection of bore well etc. (Jayaraj et al., 2007). The experience with the earlier project have also shown that people’s participation can be ensured by making augmentation of water resources as the rallying point (Annamalai, 2000) and these experiences have been
effectively used in the JFMCs and significant achievements have been made to augment the water resources of the CFC. The findings in the current study are in corroboration with the earlier experiences of TAP and other projects in the country.

In general, the projects implemented in the country are confined within the project activities or components only and the schemes and programs of line department were not rationally integrated in the existing schemes. Though the activities of Line Department are carried out in the same project villages there is no synergy between the forest and the line departments; more over there exists a conflict between the departments which neither achieved the common objective nor involved people’s participation for similar objective (Sreedharan et al., 2010). However, the current study found that the activities of Line Departments particularly the DRDA have been judiciously incorporated in the FDA activities and for which the FDA played significant role in influencing the line departments and brought out significant changes in the EPAs. The involvement of line department created assets like Black-Top Road (20.5 Kms), Bore Well with Motor, Group Houses, Improvement of Kutcha Houses, Soil and Moisture Conservation, Community Assets, Solar Pump and light, Improvement of Road, Improvement of waterfalls and Ecotourism site, Maintenance of Community Assets, Facilities in school building, Battery Operated Vehicle for Ecotourism, Bore Well with Motor, Check Dam, Tractor with Trailer, Mini Bus for tribal children to go to school, Training and Development, School building and Class Rooms, Drinking Water Facility, Solar Powered Motor, Elephant proof trenches, supply of Bee Keeping boxes, Cooking shed in schools, Construction of Group Houses, and Lemon Grass Oil Distillation Shed which indicated the synergy and linkages developed between the departments through the influence of FDAs (Plate 6 and 7).

The current investigation observed that among various FDA activities, ANR was found to be the major task. Rath (2002) highlighted that the community forest management patches have shown better regeneration and stocking of trees. It is also important to
mention here that the relation between the State Forest Department officials and the community is very congenial. Similarly, the ANR component had contributed significantly in the natural regeneration status and it could be visually seen that the condition of the forest had improved from the base year (2002). The Mixed Plantation component of NAP scheme had attracted higher outlay in respect of Western Zone and Hilly Zone which accounted to be Rs. 112.56 lakhs and Rs. 68.76 lakhs respectively and augmented the stocking density of multipurpose floral species which thus lend support to the findings of earlier work (Plate 8).

The existing schemes related to Forest development and improvement in the Country have inculcated capacity building as the core activity in order to create enough awareness and develop skill and expertise on the participatory Forest Management System to create sustainability (Gupta, 2006). Accordingly, in the current FDA activities also, capacity building was introduced in the JFMCs. The study indicated that enough capacity building program for skill development in the areas of Afforestation, Mushroom Cultivation, Bee Rearing, Medicinal Plants, Floriculture, Sericulture, Driving, etc., were conducted to the local dwellers to augment the income and employment generation activities (Plate 9). Similar training programs were conducted in the TAP villages involving NGOs (Ranganathan and Sundaramari, 2002). Similar to this Sri Krihsna Arts and Science College, Coimbatore also organized a week long tribal camp at Sadivayal and Seenghapathy villages. The tribals were exposed to the importance of education, women involving themselves in income generation, prevention of child labor and drug abuse (The Hindu, 2011). Information exchange and transfer through collaboration and coordination between and among institutions need to be promoted for effective technology transfer; however these activities are found to be lacking in the Forest Department activities resulting in poor technology transfer. (Matthais Halwart, 2005). In the current study also it is found that wide range of training programs were conducted both by Forest Department and the Line Departments which indicated the congeniality existed between the Departments to augment the rural livelihood system. However the technologies transferred were not fully adapted for up
scaling and adoption of the system which needs strong intervention for long term sustainability towards improving the livelihood system of the Forest Dwellers. The technologies delivered should have inculcated up scaling and sustainability plan in order to gain confidence of the forest dwellers.

In a holistic perspective, the current study has inventoried and documented the ongoing schemes and their nature and their role in Forest development. Accordingly, it was found and reported that forestry activities of FDAs formed the core sector of the forest division activities coupled with the schemes operated by the Line Departments. All these activities have created significant achievements both physically and financially, but these co-generated activities need to be strengthened and intensified for sustainability of the programs and activities towards conservation and protection of forests which thus warrants comprehensive and clear cut policy regulations and guidelines in the implementation of activities of FDA.

5.2 IMPACT OF FDA ACTIVITIES ON SOCIO ECONOMIC STATUS OF THE TRIBAL HOUSEHOLDS

The successful implementation of any project activity could be measured possibly through impact assessment on the socio economic factors, particularly when the programs are implemented in a participatory mode (Gupta, 2006). The effective JFM initiatives require assessing the household characteristics and its impact on reforestation and management (Nesmith 1991; Belsky, 1993; Sarin, 1995a & 1995b). Accordingly, the household characteristics of JFMC villages in the study of FDAs were assessed and reported. It is also equally important to assess the composition of communities available in the CFC. It will be a guideline to illustrate the level of participation extended by the particular community in the activities of FDA.
5.2.1. General Characteristics of the Selected Sample Households

The study found that the Western Zone was enriched with tribal population followed by SC communities who are actively involved in the various activities of FDAs in CFC. The share of other communities like MBCs, OBCs and BCs was found to be more in the Hilly Zone (Figure 7). Santhoshkumar (2008) found out that the Attapady area of the Kerala State comprised of SC / ST, BC and Forward Community (FC) households, among which the SC and ST accounted for 62 per cent to the total population considered for the study. Gautham et al. (2007) pointed out that the SC and ST communities were most benefited followed by BC through Integrated Rural Development Program (IRDP) which lend support to the findings of current investigation.

The composition of different communities in the tribal villages might affect the status of tribal living and hence further migration of tribals should be checked at institution level. The tribes should have their own protection groups to protect the forest resources for which their livelihood depends. Gupta (2006) highlighted that some tribal communities began to organize themselves for the preservation of their own resources from exploitation in the face of the well organized forest based industries and more powerful state machinery. There has been almost a continuous struggle over a century as manifested by them. Some tribal communities are organized into what has been termed as “Self Initiated Forest Protection Groups”. Similar Forest Protection Groups may also be established at VFC level to avoid depletion of forest resources from theft, destruction, fire and other natural hazards. However such protection centers were not established in the study sites which thus warrant necessary changes in the operational guidelines.

The Ministry of Tribal Affairs, Government of India is responsible for planning, promotion, coordination and overseeing implementation of tribal development programs for the development of STs. Various constitutional provisions also emphasize the need for a strong watchdog and protector of tribal community and their identity,
habitat and natural wealth surrounding them. This is very much necessary to prevent exploitation of tribals by many unscrupulous, vested interest groups. It was also observed that there are 194 Integrated Tribal Development Projects (ITDP) implemented at block level, wherein the ST population is more than 50 per cent of the total population (Sukai, 2010). Villages with a population of 10000 or more and having 50 per cent or more of tribal population form pockets under Modified Area Development Approach (MADA) and 259 such MADA pockets have been created. So concentration of tribes in the study area also facilitates dissemination of benefits of area specific schemes like NAP implemented through FDAs in Tamil Nadu.

The family size is associated directly with the land, livestock and tree holdings. The family size and size of land holding are associated with farm size increase (Gupta, 2006). Parthiban and Rai (1994) found that the average size of the family among sheep and goat rearers were of large size (more than 6). The present study classified the families of the study FDA into three groups viz., Group I (Less than 3 members), Group II (3-5 members) and Group III (Above 5 members) and it was found that the family size in the FDAs area predominantly fell under the category II (3-5 members group) (Figure 8). Similarly the members of the family are mostly of middle age group (40-60). The size of the family in the forest ecosystem is very important which directly or indirectly influence the forest management activities and hence the medium size family in the current study indicated that the family size had significant role in conservation and management of forest due to rationale fodder and fuel wood collection.

It is also found in the current study that, more than 50 per cent of the tribal households were holding marginal land size (less than 1 ha). The dominant cropping patterns are ragi followed by rice and millets. Commercial crops like banana, flowers and vegetables are also grown in few pockets of the study areas (Figure 9). The study found that the land held by the respondents belongs to forest department which was allotted to them for subsistence agriculture farming to meet their day-to-day needs. The farm efficiency
can be improved with the larger land size (Nemade and Wankhade, 2010) but there is no scope for expansion of agricultural area in the study FDAs and hence the efficiency may not be improved due to increase in land size. The cultivation of sugarcane and other cash crops have generated more income in the forest watershed of Thiruvallur district of Tamil Nadu (Sivanappan, 2002). However introduction of sugarcane and other cash crops in the study FDAs may not be possible due to their attraction towards wild animals. It is earlier reported in Anaikatti Forest area of Tamil Nadu that 12 per cent of the households wanted to cultivate only millet crops and 66 per cent of the total respondents wanted to continue with dry farming (Seema, 2005) due to lack of awareness and efficient technology transfer systems. The current studies also in conformity with the observation of earlier findings wherein the respondents of the current study are not changing their cropping pattern since long due to lack of awareness coupled with lack of adequate technology transfer system. The sustainability of any land use depends on local farmers’ acceptability, household needs and the risk and uncertainty of the cropping system (Tewari, 2000) which also lend support to the findings of farming system practiced in the study area. But introduction of high yielding varieties and the associated precision technologies would help the farm efficiency. Such technology transfers were not evidenced in the study FDAs due to lack of awareness and efficient technology transfer mechanisms.

5.2.2. Social Impact Created among the Tribal Households

The tribals have historical relationship with their land and forests. They have developed over many generations a holistic, traditional and scientific knowledge of their lands, natural resources and environment. Anthropological studies have revealed the significance of a proper understanding of tribal way of life, customs, believes and superstitions etc., for the success of any developmental effort (Shukla, 2000). Hence studies were conducted to assess the tribal social status through, education, literacy, living, health and other social indicators. The study found that the percentage
of illiteracy was reduced to a level of 9.52 when compared to the base year 2002. Within five years of inception of FDA, illiteracy was slashed from 35 per cent to 32 per cent in CFC and the same had become functionally literate (Figure 10). The change in the functional literate was accounted to be 45.45 per cent increase over the base year of inception of FDA (2002). All other category showed no change in the level of education.

Swaminathan and Vidhyavathi (2002) in their study stated that around 50 per cent of the households were illiterates and nearly 25 per cent had only primary education in JFM Village of Salem Forest Division. The educational status of farm heads in the tribal environment of Dharmapuri District influenced greatly in adoption of farming activities (Govindaraj, 2006). In respect of educational status, 44 per cent had secondary level of education which called for intensification of awareness creation activities in respect of acquiring education and technology of farming. Zacharias (2003) pointed out that backwardness in education is an important cause for economic backwardness. It is in the light of this fact; the central and state governments attach greater importance to STs economic progress. From infancy onwards, greater emphasis is being paid to education programs. Major part of the money set apart for economic development is being spent on education in Kerala. Preferably Balawadis, Nursery Schools / Single Teacher Schools, Educational Facilities up to the high school level, Hostel facilities, and financial assistance for boarding and tutorials, grant to parents and modern residential schools. As per 2001 Census, the literacy rate among tribes was found to be 47.10 per cent which was far below the overall literacy of the country which stands at 64.84 per cent (Sukai, 2010). A review of literacy rates among the ST population in comparison with that of the general population indicated a growing gap between the literacy rates of the tribal communities (Narayana Swamy, 2010). The literacy per cent in the study environment is 65 per cent and this level is slightly higher than the national average literacy rate among the tribes. Adequate changes in educational advancement could not be experienced because of non availability of trained teachers in the primary schools and no efforts made to upgrade the schools from primary level to middle school level or
high school level or higher secondary level forced the households to stay mainly in the primary level of education. Hence, it is very essential to appoint trained teacher to impart quality education to the poor households by upgrading the infrastructure in schools and providing the books and learning materials at door step. Besides, awareness creation exercises are to be periodically made to the tribal poor so as to gain knowledge and expertise. To sub-serve these needs, the eleventh five year plan envisages maintenance and improvement programs of 19 tribal schools under the control of Forest Department and also programmed to start 37 new residential tribal schools (GOI, 2010) which lend support to the findings and observations of the current study.

Besides education, the participation of the people, nutritional status, involvement of women, availability of medical and health status, migration and other developmental aspects of the people are the other social indicators involved in monitoring and evaluation of projects (Suresh Kumar and Palanisami, 2002). The social indicators include both direct and indirect benefits. In the study area, traditionally people lived in Kutcha houses (houses made of local materials) and due to FDA activities 32.94 per cent of Kutcha houses were converted into Pucca houses by providing construction materials such as bricks, cement, tiles and door (Plate 10). Among the 3 FDAs, it is only Coimbatore FDA which had a remarkable and noticeable achievement in respect of establishment of new houses followed by the Nilgiris FDA which showed the improvement in social indicators in terms of housing facility (Figure 11).

Electricity connection to the houses of FDA villages was found to be remarkable (Figure 12). Among the three study FDAs in CFC, the poor performance was noticed in Anamalai FDA and hence concerted efforts are needed to provide electricity connection to all the tribal houses. Since the houses are constructed in the forest environment, survival without electricity becomes a threatened one. Under these circumstances, a cent per cent power supply to all the houses should be made by dovetailing budgetary support from line departments. The Forest Department can concentrate on ensuring
power supply to all the houses constructed in the tribal environment in association with electricity department or establishment of biomass based power generation facility through the DRDA activities.

The study also found out increase in asset value of the house during the study period and it was estimated to be 87 per cent increase in asset value. Elanchezhian (2005) indicated that the average value of assets per households increased with farm size. House was the major non-farm asset, the average value of the assets increased with farm size. A study carried out by Zacharias (2003) revealed that the Scheduled Tribe Development Department undertakes the construction of houses with tiled or concrete roofs. Financial assistance was provided for maintaining the thatched houses and electrification of houses and energization of wells. Besides, provision has been made to purchase land to ST people for construction of houses in the tribal environment. On examining the nature of houses and the condition of forest roads available in the study area indicated that the share of investment and asset creation was found to be inadequate to cater the needs of dwelling tribal population. Hence an increase in the investment need to be made by dovetailing funds from other heads entitled “Tribal Sub Plan”. The District Officials concerned should be identified and the nature of works to be executed should be placed before them, appraised and get it sanctioned for immediate action. To address these issues, GOI through the eleventh five year plan envisaged construction of 3000 houses in the tribal areas of Tamil Nadu including the three FDA divisions (GOI, 2010) studied which thus attests the observations of the present findings.

A study on the impact of the JFM in Kerala by Santhoshkumar, (2008) indicated that the EDC formed in Kerala State has actively participated in eco tourism activities and the members of the EDCs were serving as tourist guides for visitors apart from undertaking the activities of Vana Samrakshana Samithies (VSS) and Adivasi Vana Samrakshana Samithies (AVSS). However, such activities were not evident in any of the VFCs / EDCs formed in the current study area. Though EDC was formed in the Anamalai FDA, the activities of EDCs were not
encouraging. The Anamalai FDA has full tourism potential but the same was not tapped by the members of EDCs. This might be due to lack of awareness on the eco tourism concepts among the members. Hence the implementing forest department should take the EDC members to the successful eco tourism spots in order to create awareness and to learn the activities and the applications of eco tourism in order to generate adequate employment and income as in Kerala (Santhoskhumar, 2008).

The VFCs / EDCs set up in different study FDAs had the presidents from the Male category only. The women member should be elected as president at least once in three year as per NAP guidelines (GOI, 2005). But electing women member as VFCs /EDCs president was found to be ignored in Anamalai and Coimbatore FDAs. The Nilgiris FDA had accommodated the female members as presidents of VFCs / EDCs. Similarly, the study on participation of women in JFMC activities indicated that the percentage of women member participation was found to be higher in the Nilgiris FDA followed by Anamalai FDA. The Coimbatore FDA had poor female member participation in FDA activities because of much alternate employment available to them due to the proximity of Coimbatore City. Enrollment of male and female members was found to be almost equal in all the FDAs of the study area. Within the overall dynamics of social change gender roles and gender relations within both tribal and non tribal dependence are changing. Rural women are major actors in India’s forestry sectors. Besides gathering a diverse range of NTFPs, they participate as wage laborers in forestry works. It is widely recognized that tribal women have better status within their own communities (Gupta, 2006). However the women respondents in the current study indicated that their role was not very significant and their participation in the FDA activities was less than the level expected. Gautam Dey (1997) reported that woman as vice president evinced keen interest in educating other members about the importance of forests, as well as planning, protection, maintenance of the treated areas in the village however such participation of women members was not evidenced in the current study FDAs due to lack of awareness, education and male dominant life system in the tribal society.
Prabhakaran (2002) pronounced that in Medicinal Plant Development Areas (MPDA), the general body comprises of all adult members of households in that area and they in turn select the Management committee consisting of 11 members, 2 from Forest Department and one from Non Governmental Organization (NGO). Out of the 8 members, four each should be men and women members. The general body should meet at least once in a year following the methodology of JFM.

Participation in JFM is not only considered as a means of effective implementation of JFM but also an end in itself. However, it is a well recognized fact that participation is a multivariate phenomenon explained by wide range of personal and socio-psychological variables, due to which it is expected that the extent of participation can exhibit variation from group to group, place to place, time to time, situation to situation. It is therefore, quite natural and logical to observe a significant variation in the extent of participation between JFMCs (Lal Singh, 1997). In the study area also, the level of participation differed between FDAs and between VFCs / EDCs within the FDA and also there existed the deviation in conduct of general body and executive body meeting. The periodicity of meeting seems to be critical in the operationalization of co-management mechanism between the community and forest department. However, the response and the observation in the current study indicated that there seems to be very little awareness and lack of seriousness in conducting periodical meeting and a large majority of respondents were unable to recall the minutes of the last meeting (Plate 11 and 12). Similar results were also observed and reported at the VFC meetings of The Nilgiris Biosphere reserve (Keystone, 2010) which indicated that JFMc as a whole, irrespective of implementing forest divisions need to create enough awareness on the role of members in Forest Management Activities. All these underpin a clear and understandable guideline to the stake holders and their implementation process.

The Peoples’ Participation Index (PPI) for planning, implementation and maintenance stage of Watershed Development Program was very low with overall PPI as 42 per cent.
This could be attributable to the fact that those who were not benefited from the project directly might not have participated in the implementation and maintenance (Sureshkumar and Palanisami, 2009). Similar observations were made in the current study wherein the average participation index was only 45 per cent which is in conformity with the earlier findings and hence the study suggests suitable mechanism to augment the participation level of people for successful implementation of FDA program (Plate 13 and 14).

The hygiene and health of any locality is an indicator of social status. Hence, studies were conducted to assess the status of health facilities and it is found that no primary health centers are operating in the study FDAs and the people had no health facility in the study villages. The study also found that, people have to travel 5-6 kilometers to avail health facilities which necessitate adequate intervention by the implementing agencies. However, the health camps conducted due to influence of FDA provided minimal health assistance to the tribal households of the study FDAs. To augment the health and hygienic status of the tribal households, the eleventh five year plan has made provisions for the construction of five health care sub-centers in Tamil Nadu (GOI, 2010) which included one of the currently studied FDAs viz., Anamalai FDA.

The social impact studies conducted in CFC due to the influence of FDA activities indicated that there is an improvement in the general social indicators; however the developments are not adequate to the level it was expected, which need further improvement through the participating institutions. The FDAs have not concentrated much on health, communication, providing protected drinking water etc. It would be desirable to channelize all the development works of the line department through the FDA in the remote forest areas. The presence of the FDAs can be effectively utilized and simultaneously the synergy between Forest Dwellers and Forest Department may be developed (Jayaraj et al., 2007). Hence, the study recommends thorough review on the baseline status and based on the baseline socio economic indicators, the new activities
have to be inculcated right from microplan preparation by comprehensively involving all stakeholders incorporating the basic needs of the forest dwellers coupled with afforestation and reforestation activities to restore the forest cover through ANR process.

5.2.3. Economic Impact Created among the Tribal Households

The objective of any program is to transform a set of resources into desired results and outcomes. Among the various outcomes and deliverables, the economic indicators in terms of income and employment generation are the key factors which decide the positive or the negative impact of the project (Suresh Kumar and Palanisami, 2002). Hence, attempts were made in the current study to assess the economic impact of the FDA activities through the economic indicators viz., employment and income generation activities.

The employment generation for the people in the study locality was mainly due to agriculture, livestock, forestry and wage labor in other schemes. The study found that there is a marginal increase in employment after the inception of FDA. Among the various factors, forestry operations created an average man days of 63 per annum followed by wage labor (55), agriculture (38) and live stock (11) accounting for 30.95 per cent increase over the base year 2002. A study on tribal households of Mayurbhanj of Orissa revealed that employment per worker varied with the size of tribal household. The total days of employment per worker was 174 man days and it was 58.6 Per Cent through wage earning and only 20.7 Per Cent from farming activities (Athibudhi et al., 1992). Similarly dry land dairy farming was practiced as primary occupation (Thangavelu et al., 1995). However in the current study, forestry activities contributed significantly for the employment generation and the dependency of people on the livestock in all three FDAs is only marginal and the livestock influence on the economic status is only meager. In overall perspective, the FDA activities directly through forestry operations and
indirectly through the activities of line departments have generated adequate employment opportunities more than the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) scheme during the study period (Figure 13).

Similarly, the household income level through FDA activities has also increased significantly from Rs.5790 (2002) to Rs.12365 (2007) through wage employment, NTFP collection, agricultural activities (Plate 15) and livestock rearing (Figure 14; Plate 16). The income generation during the 5 years of inception of FDAs (from 2002 – 2007) has increased to the tune of 114 per cent. The augmentation of income generation in the JFM based villages of Salem forest division due to various forestry activities was also earlier reported (Swaminathan and Vidhyavathi, 2002). Similarly, increase in household income from 27 to 45 per cent at the JFM villages of various forest divisions of Tamil Nadu (Sreedharan, 2002) also extends support to the findings of current study. Studies were also carried out in the tribal economy of the Nilgiris in Tamil Nadu which reported that the tribal earned on an average Rs.11180 per household per annum through NTFP collection during off seasons and generated 253 man days per annum with average earning capacity of three members per household (Sekar et al., 1996; Balakrishna et al., 1992). However in the present study, the overall income including through NTFP collection resulted in additional income generation and the increase was due to the FDA activities. The income distribution (Lorenz, 1905) studies indicated that, inequality in income distribution continued in the Anamalai FDA even after the implementation of several FDA activities (Figure 3, 4 and 5). However, in Coimbatore FDA and the Nilgiris FDA, inequality in income distribution was found to be reduced considerably after the inception of FDA. The results were also confirmed by Gini Concentration Ratio (FAO, 2001) which also indicated inequality in income distribution.

5.3. FACTORS INFLUENCING PARTICIPATION OF TRIBES IN FDA ACTIVITIES

Forest and tribals share the common lot and they have a common history of suffering, neglect and exploitation. Forests satisfy a great range of human needs which vary from
tangible raw materials like fuel, fodder and shelter and also from intangible benefits of environment equilibrium. From time immemorial, the tribals depend on forests for their livelihood systems. India is endowed with 65 Per Cent of the total forest cover together in the total tribal districts. As far as Tamil Nadu is concerned, 15 districts are housed with tribal communities and the study area of three forest divisions viz., Anamalai, Coimbatore and the Nilgiris are known for tribal dominance (Census, 2001). These tribals are inhabitants and depend on the forest for their day today needs. The tribals regularly collect fuel, fodder and other NTFPs for their livelihood system. These factors certainly either directly or indirectly influence the participation of tribes in the forest management. Hence studies were conducted and the factors influencing tribal participation in the FDA activities were assessed and discussed here under.

The factors which influenced the participation of tribes in FDA activities were identified as fodder, fuel and NTFP collection. Among the various factors inventoried in the current study, fodder collection stood first because of the daily needs. The predominant frequency of fodder collection was once in a week and twice in a week. The number of households involved in fodder collection was found increased due to rise in the number of animals per household in the study area particularly sheep population. This led to increase in quantity of fodder collected from 33 kg (2002) to 47 kg (2007) per trip. The distance travelled to collect fodder was found to be less after the inception of FDAs in all the three forest divisions due to the availability of fodder within the forest area because of the augmented regeneration status through the activities of social fencing.

The study also found that fuel wood collection is another factor which also decides tribals participation in FDA activities. During the early period of the study (2002), the quantity of fuel wood collected per trip was 28 Kg and it rose to 35 Kg during 2007. The fuel wood collected per trip was increased and the number of trips have been reduced which indicated that the households have diverse and multifarious activities other than fuel wood collection. Sunny Shah (2010) reported that the fuel wood was
collected normally for two reasons. First are for cooking and second is for lighting purposes. Villagers use kerosene for light but availability was again less due to lack of road and transportation infrastructure in the study area. Kerosene lamps are serious fire hazard in the forest villages whereas solar electric light comes as the safest measure. Hence, Kerosene is not permitted in the study FDAs. So the kerosene availability or gas availability was not taken into consideration for fitting regression model of factors influencing fuel wood collection in the study area.

The fuel wood collection was influenced by many factors as found out through regression analysis which indicated that family size and number of trips have contributed significantly to fuel wood collection, whereas the distance travelled has not influenced the fuel wood collection. The earlier studies conducted in tribal settlements of Kolli Hills of Tamil Nadu reported that the family size and number of trips influenced the quantity of fuel wood collection which lend support to the current findings (Elanchezhian, 2005).

The majority of the JFM areas showed lower tree species richness as well as diversity value but higher stem density compared to the unprotected areas. People’s preference was fuelwood in JFM areas and timber in the unprotected areas. Findings also indicated the need for promoting regeneration of fast growing species and the development of fuelwood plantations around the centers of high consumption areas. The Forest department needs to concentrate on plantation development activities considering the needs of the tribal population (Tiwari and Phalguni Kayenpaibam, 2006). The present study also showed the various plantation activities carried out in all three FDAs in order to support the livelihood of the tribal population living inside the forests. Shadhganga (2010) reported that the tribes were inhabitant in the interior forests and hence they were dependent purely on forests for their fuel wood. Paniya and Irula tribal households were not using kerosene and gas as fuels for cooking. In the present study, the tribal villages
are not using kerosene and gas for their cooking purposes as one of their fuels. Hence, including the kerosene/gas as one of the variables influencing fuel wood collection was not considered in this study.

Forest products in particular the NTFPs, play an important role in the livelihood of people living in or near forests (Quang and Tran, 2006). The people use forest products both for household consumption and income generation (Fisher, 2000). In subsistence economies, forest can provide many essential products and services to local people (Wong, 2000) and in open economies, the forest dwellers can trade their products and generate considerable employment and income (Lawrence, 2003; Ambrose-Oji, 2003). The local communities need to be directly involved in and share benefits of forest protection and management (ODA, 1994). Many JFM study areas in India are witnessing the spread of protection system to neighboring areas (Sharma 1995; Poffenberger, 1995, 1996 a,b). Hence NTFPs are the causation factors and influenced significantly the participation of tribes in FDA activities. In the study area, the tribal VFCs were given the NTFP lease units at free of cost as per the directions of the State Government (Annexure III). This ensures protection to forests through social fencing. The factors like family size, number of man days employed, condition of forest and distance travelled decided the collected quantity and value. Among the various factors, condition of forest during the period between 2002 and 2007 improved significantly which contributed higher NTFP collection than the FDA inception stage in 2002. However, the participation of local tribals in sustainable harvest of the NTFPs and profitable marketing is yet to be accomplished for want of suitable harvest techniques and associated value chain management system. This calls for immediate attention to streamline the harvest and marketing of NTFPs for the maximum benefit of the local tribals. The implementing agency in association with the line departments should incorporate enough capacity building programs in their microplan based on the available NTFPs and its associated value chain management in order to achieve higher profit to the forest dwellers.
The income derived from NTFPs was the single largest source but it was not sufficient to meet even the subsistence requirement of food economy of the tribal community living in and around the protected areas of Kote region as reported by Ravi et al. (2006). Their results of Logit analysis have explained that wage employment, land ownership and agricultural income significantly reduced the probability of tribal households involving in NTFP collection. Their study also revealed that it was primarily out of sheer necessity that the tribals venture for NTFPs and not for their commercial gains. In the present study, it was different scenario where 37 per cent of the tribals annual income came from forestry sector in way of plantation activities, wage employment and NTFPs collection. But Anshu Singh et.al (2010) found that the contribution of NTFPs was quite high as it contributed almost 79 per cent (Rs 80,000) on an average to the annual income of the collector’s family in Madhya Pradesh sunderban Biosphere Reserve.

NTFPs contributed towards poverty alleviation and sustainable forest management and played a significant role, particularly firewood (92 per cent), Fodder (63 per cent), Bee Keeping activities (40 per cent) and Environmental Goods and Services (40 per cent) as indicated by Richard Giliba et.al (2010). This study also indicated that NTFPs contributed significantly in income and non-income poverty reduction and thus incentives for sustainable forest management. They also reported that the NTFP collection trend varied from different forest and management regimes as in case of present study area. But this was not so in the present study site as tribal dependency on forests was 36 per cent and almost it was same in all FDAs.

In the study FDAs size of the family was one of the significant factors affecting NTFPs collection. According to Opaluwa et al. (2011), in Nigera also regression analysis revealed that apart from the gender and distance, family size was found to significantly increase the odds in favor of collecting NTFPs. The similar study conducted by Shiba P Kar (2012) on assessing the role of NTFPs in contribution to household economy showed that the contribution of different types of NTFPs to household economy varied in terms of
subsistence and cash income. Income data analysis also revealed that the poor households are relatively more dependent on NTFPs for their subsistence and cash income than the better-off households. There are many other socio economic factors at the household level such as number of members in the household and total value of household implements and furniture that are significantly correlated with NTFP income. The author also opined that more site specific applied research on NTFP income and influential factors were necessary to generalize the findings for other parts of the world with similar socio economic and environmental settings.

Govindaraj (2006) carried out a study in Dharmapuri District indicated that the distance travelled for accessing medical and other basic needs could be met locally other than the marketing requirement. For marketing of farm produce by the tribes, they have to travel for 30 kms distance. The required intervention in this context is establishing farmers’ organization at village level so as to have collective bargaining in the market. Besides, possibilities of establishing processing and value addition centres could also be explored to realize higher price per unit of the farm produce. Similarly in the present study also distance to the market from the tribal village played a significant role in NTFPs collection both positively and negatively in pre and post project situations.

Marketing of the produce plays a major role in involvement of people in production activities especially in case of farm produces and livestock products. Swarn Lata Arya (2010) outlined that the impact of watershed development programs on seasonal livestock migration in the villages of shivalik hills in Haryana and determinants of likelihood of such migration. The results revealed that though the watershed development projects have helped in improving the productivity of agricultural land, the same gains are still to be realized on common lands because small and landless households entirely depend on common lands for livestock rearing. Market access found to be the crucial factor in livestock exploitation.
Besides all the factors indicated above, the general characteristics viz., education status of the head of household and women, age, family size and annual household income were also critically analyzed and the study found that the education level of head of household contributed significantly to the tribal participation in FDA activities. In general, the literacy status in the locality of the study FDAs was 65 Per Cent which is the major contributor of moderate participation prevailed in the FDA activities.

The study on identifying factors influencing people’s participation in FDA activities revealed that general people’s attitude, condition of the forests and the linkages between the forest dwellers and the forest department have played major role. However these activities are not as per the guideline expectations and policy framework. The reasons for under performance are many but the key reasons are lack of adequate awareness, the inherent forest management system coupled with lack of legal provisions. No program has been evolved for large scale participation of people in afforestation and other forest management activities which requires institutionalization. Therefore a necessity was felt by the planners and foresters for social controls through public participation in forest management (Shiva et al., 1987). Sharma (1995) also indicated the same views, which thus corroborate the findings of the current study.

5.3.1. **Constraints Faced by the Sample Households in Different Activities**

Any activity initiated at field level facing success indicated that there are no constraints much among the respondents. If the activity implemented at field is not progressing to the desired level, there exists plenty of constraints which need to be immediately addressed. Similarly if activities of the FDA are to be successful, the constraints prevalent in the environment should be first looked into and redressed to have an all round development. The sample households expressed their problems activity-wise and are discussed constraint-wise.
5.3.1.1. Constraints Faced by the Sample Households in Crop Production Activity

The sample households in CFC faced certain constraints in income and employment generation activities. Analyzing the constraints with respect to each activity might provide way to develop appropriate strategies for redressing the constraints. The constraints faced by the households in agriculture activity were delineated and discussed. In the Anamalai FDA, being a protected area (wildlife sanctuary and national park), the crop production activity was found to be affected by wildlife periodically posing threat to agriculture. This constraint ranked as number one by the households of the Anamalai FDA. It is widely prevalent in all the FDAs of the study area and all the households of CFC as their principal constraint during 2002 situation. But the same is not true in the case of households of FDA during the post project situation and this constraint scored second rank. The first Constraint is the size of holding. This was mainly due to the small size of land holding to engage many in agricultural operations. For want of land, the tribals were unable to indulge in the agricultural activity. Even after indulging in agricultural operations, very poor price was offered to their farm produce. The wild life damage scored second rank and this proved way to the erection of electric fence in certain places to prevent the wild life from entering into the lands and human habitation.

The next important constraint was found to be the lack of technology adoption in the holdings of sample households. Lack of awareness might be the main reason for non adoption of proven technologies. Vishal Krishna (2007) pointed out that timely provision of market information to the farmers resulted in realization of 30 per cent increased price for their produce and hence this system of announcing price and market information to the tribal households through mobile phones by providing appropriate linkages with the institutions like Tamil Nadu Agricultural University, where the price information for principal crops have been announced periodically to the stakeholders. Such linkage provisions may be made to the tribes by grouping them under the fold of
either Commodity Interest Groups or Farmer Interest Groups. The market and price information delivery system coupled with dissemination of proven technologies will certainly help to augment the rural livelihood system of tribes.

Another constraint reported was theft. In the Anamalai FDA, it was found to be an important constraint and ranked second during 2002 situation. Unauthorized harvest of agricultural crops by some miscreants resulted in loss to the farm owner and hence an institutional mechanism needs to be established by the tribal households themselves to protect their crops from such problem. The members of VFCs should establish policing to protect the crops from such damages.

5.3.1.2. Constraints Faced by the Sample Households in Livestock Production Activity

The constraints faced by the households in livestock production activity was small grazing area, lack of veterinary care to the animals, high input price, wildlife damage, lack of market facility and high purchase price of animals. It was revealed that among the constraints, wild life damage was found to be the principal constraint among all the sample households and ranked as number one constraint. In Coimbatore FDA alone, the constraint scored second rank during the 2007 situation revealed that the holdings were properly fenced with electric fence and trenches were also made in the locale to avoid crossing by wild animals and damaging the crops. The procurement price of the animals ranked second important constraint. Higher procurement price of animals forced the households to sell one or two animals in the market to buy productive lactating animals to meet the milk requirement. Lack of veterinary care was found to be yet another constraint. The VFCs of adjoining villages through the SHGs can appoint one veterinarian on contractual basis in liaison with the Forest department to meet quality veterinary care. On successful implementation of such practices, the same can be extended to another area for replication.
5.3.1.3. Constraints Faced by the Sample Households in NTFP Collection

The principal constraints in NTFP collection activity were low wage rate, depletion of NTFP stocks, threat from wild animals, harassment by forest officials, lack of prompt payment of wages, distance to travel for NTFP collection. Among these constraints, the low wage rate was found to be the principal constraint and ranked as number one among all the households of all FDAs in the CFC. It was evidenced that the low wage rate realization can very well be resolved by changing wage rate for the collection, processing and procurement of NTFPs by VFCs or SHGs themselves. Studies also reported that there has been a decrease in income from NTFPs collection after the establishment of VFC. The reason for this is that the individual traders / contractors used to bid for collection of NTFPs from the lease units would also invest in establishing watch and ward over the NTFP resource rich environment, particularly for amla and tamarind rich environment. This would ensure maximum harvest with small loss due to crop raiding animals. But after formation of the VFCs, no separate watch and ward mechanism was provided which resulted in huge losses during pre harvest stage itself. After 2002, the NTFPs are allotted free of cost to the tribals. Hence VFCs themselves should appoint watch and ward services to protect the lease units of NTFPs in their environment. The second constraint was found to be lack of prompt payment of wages. Similar problem was also experienced in Kerala (Masuda et al., 2005). The periodical visit by District Forest Officer (DFO) concerned to the VFCs and interaction with the tribes and mutual consultations would resolve these issues.

5.4 POLICY OPTIONS FOR SUSTAINABILITY OF FDAs : RECOMMENDATIONS

Forest resources in an economy constitute significant position, which should be treated in a holistic manner in order to realize many benefits. It has been increasingly feared by the planners and policy makers about the forest degradation and its impact on growth, development and environment of the country. During the past five decades of planned development, enough efforts have been made both by central and state governments
and contributed significantly for the development of forests. However due to developmental projects, urbanization, industrialization and other anthropogenic pressure coupled with poor productivity of Indian forests has ushered in a total mismatch between demand and supply. To resolve all these issue, various policies and legal provisions have taken place in different phases which resulted in the implementation of social forestry, interface forestry, TNADP, JFM and now participatory forest management through FDA activities. The JFM as a concept recognizes that a symbolic relationship exists between the abutting village communities and the forests, wherein the JFM believes in a people centered approach and treat the local communities as partners in the forestry. To sub serve the JFM activities and to eliminate projects with similar objectives NAP was launched and executed through the two tier system of FDA and JFMCs.

The current study was aimed to assess the nature and type of program and the associated socio economic developmental issues resulted due to FDA activities. It is also planned to identify the key factors involved in success and failures of implementation of program and based on these factors the study was designed to make policy recommendation for successful implementation of FDA program in future by eliminating the conflicts rising among the participating institutions. Accordingly the results of the study identified the following key issues as recommendations for inclusion in the NAP guidelines and changes in the policy issues in forest management systems operated by both central and state governments.

5.4.1. Policy Changes

It is necessary to assess the dependence of the villagers on the forests for their livelihood needs especially in the context of micro plan preparation towards JFM. It is mandatory to dovetail the requirements of the micro plan with the working plan of the respective Forest Divisions (GOI, 2000). The current study also indicated the need for policy changes by incorporating necessary amendments to include all the micro plans of
FDAs / JFMCs in the respective working plan to ensure sustainability in forest management through FDA and to provide necessary legal protection to the stakeholders.

The concessional rate facilities on household consumable items as availed now by the field staff of Forest Department, from FRO to Forest Watcher may be extended to all the tribal households in the forest environs. The Government Order MS No. 302 dated 01.12.1994 pertaining to the employment of tribals as Forest Watchers by relaxing rules in the Wildlife Circle of Western Region of Coimbatore (Annexure IV) may be extended to the entire state.

Employment of rural poor under MGNREGA Scheme may be enhanced from the present norms of 100 days to 200 days for tribals living in Forest Settlements or Forest Fringe Villages to ensure sustained employment generation which in turn will help to protect the forests.

Establishment of Forest Schools on the line of Sainik Schools may be thought of for the benefit of Tribal Children. The experience gained already in running schools for tribals by the Tamil Nadu Forest Department in Vellore Forest Circle may be utilized for this purpose.

**5.4.2. Integration of all Forestry Schemes**

All centrally sponsored / central sector afforestation schemes should be brought under NAP Scheme. Similarly, all external aided afforestation schemes under a single unified scheme and state afforestation schemes under yet another single scheme to avoid confusion at the field level. Once the schemes are unified and the objectives are delineated, only one JFMC must be entrusted with implementation of all the schemes with proper identification of scheme wise targets and achievements.
5.4.3. Creation of Institutional Mechanism (CIM)

To augment the functions and activities of FDA, creation of stable institutions like Federation / confederation of JFMCs is very essential. This federation will facilitate linkages among various stakeholders for efficient functioning of JFMCs to achieve the objectives enshrined in the NAP scheme.

5.4.4. Capacity Building for Sustainable Harvest and Value Addition

All the presidents of the JFMCs and SHGs should be given periodical training on NTFP, Tribals’ Rights Act, Micro credit, PR Acts using the services of Tamil Nadu Forest School at Vaigai Dam, Tamil Nadu Forest Academy, Coimbatore, Forest College and Research Institute, Mettupalayam, etc.

5.4.5. Implementation of Innovation Projects

The innovations and diffusion of new technologies are important factors in the country’s quest for food, nutrition, environmental security and enhancement of income and employment generation. Agricultural Research and policy reforms in the country have generated outstanding productivity and created excellent employment and income generation activities through value chain models. In view of the available land resources in the forest and adjoining area and the availability of enormous man power in forest divisions, introduction of the following innovative schemes will help to augment the income and employment generation besides creating raw material for forest based enterprises. This besides the rural energy planning process can be achieved through biomass based power generation process. Hence the following innovative schemes suggested will help to create paradigm shift in the existing forest management system towards higher productivity and enhanced conservation issues.

- Value Chain on Industrial Agroforestry in JFM Villages
- Value Chain Management (VCM) in Honey
- VCM in Medicinal and Aromatic Plants
- VCM in Wild Fruits
- VCM through Forest Bio Mass based Decentralized Power Generation.

In a salubrious perspective, forests are home to rich and diverse biodiversity and the forest resources had been traditionally exploited for their productive role both for the people living within and at the fringes of forests. The forests are put under acute stress due to socio economic pressures. The resultant is extensive area of forest under varying stages of degradation. Given the current pace of development, fostering symbiotic linkages between economic growth and forests is considered highly desirable. Recognizing this need a paradigm shift in forest management was contemplated and various schemes and projects were emulated through these developments. The FDA is one such development which implemented the NAP scheme merging schemes with similar objectives and implemented in a participatory approach to augment the regeneration and to protect all the natural resources. The current study was focused on the activities of FDAs and the results of the current investigation indicated a marginal improvement in the forest ecosystem, tribal welfare and the associated socio economic factors. The study also felt that the problems existed in the implementation process coupled with conflicts between the institutions involved needed a clear and workable guidelines and necessary policy and legal provisions towards successful implementation of schemes through the FDAs in order to achieve the objectives enshrined in the Government policy.