CO-MANAGED FORESTRY AS A FUNCTION OF STAKEHOLDERS' PERCEPTIONS AND DEMOGRAPHIC PROFILE IN EASTERN ATTAPPADY, KERALA

by

REMYA RAGHAVAN

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THESIS

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DECLARATION

I hereby declare that this thesis entitled **"Co-managed forestry as a function of stakeholders' perceptions and demographic profile in Eastern Attappady, Kerala"** is a bonafide record of research work done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, fellowship or other similar title, of any other University or Society.

Vellanikkara
Date: 24/10/2014

Remya Raghavan
(2012-17-110)

Dr. S. Gopakumar
Associate Professor
Department of Forest Management and Utilization
College of Forestry
Kerala Agricultural University
Vellanikkara, Thrissur

Date: 24/10/2014

CERTIFICATE

Certified that this thesis, entitled **"Co-managed forestry as a function of stakeholders' perceptions and demographic profile in Eastern Attappady, Kerala"** is a record of research work done independently by **Miss. Remya Raghavan (2012-17-110)** under my guidance and supervision and it has not previously formed the basis for the award of any degree, diploma, fellowship or associateship to her.

Vellanikkara

Dr. S. Gopakumar
Chairman
Advisory Committee

CERTIFICATE

We the undersigned members of the advisory committee of **Miss. Remya Raghavan (2012-17-110)** a candidate for the degree of **Master of Science in Forestry** agree that thesis entitled **"Co-managed forestry as a function of stakeholders' perceptions and demographic profile in Eastern Attappady, Kerala"** may be submitted by **Miss. Remya Raghavan (2012-17-110)**, in partial fulfilment of the requirement for the degree.

Dr. S. Gopakumar
Associate Professor
Dept. of Forest Management and Utilization
College of Forestry, Vellanikkara, Thrissur
(Chairman)

Dr. K. Vidyasagaran
Associate Professor and Head
Dept. of Forest Management and Utilization
College of Forestry, Vellanikkara, Thrissur
(Member)

Dr. A. V. Santhoshkumar
Associate Professor and Head
Department of Tree Physiology and Breeding
College of Forestry, Vellanikkara, Thrissur
(Member)

Dr. P. Ahamed
Professor
24-10-2014
Department of Agricultural Extension
College of Horticulture, Vellanikkara, Thrissu
(Member)

24/10/14

EXTERNAL EXAMINER

(Dr. Thamban. C)

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Introduction

INTRODUCTION

Forest is a basic life supporting system which provides goods and services for the nation. A sustainable forest management approach is needed to satisfy the ecological, social, economic, cultural and spiritual needs of the present and future generation. The National Forest Policy, 1988 admits that it is unjustifiable to consider forests as revenue earning resources and use it for various non-forestry purposes. National Forest Policy also stresses on the need to involve local in forest management activities. Consequently several approaches were initiated to conserve forests with the involvement of local communities many have not yielded the results as desired. The failure of incorporating the local communities in natural resource management by many highly centralized bureaucracies is now being widely studied (Conroy *et al.*, 2002).

Involvement of people in management of forest resources not only contributes to the restoration of degraded ecosystem but also reinforces the foundation stone of cost-effective conservation. Thus to implement such efforts, decentralized and co-managed forestry management programs called Joint Forest Management (JFM) were promoted in India since 1990. The JFM guidelines of 1990, called for changing the conventional approach to that of one prioritizing environmental stability and the welfare of local communities (Pari, 1998). It took initiative in encouraging people to participate in collective decision-making process so as to empower the village community.

In 1990 JFM was formally implemented nationwide by all state governments and Union Territories. The common feature of this governmental programme was promoting community forestry through the allocation of power and responsibility amongst government and local people over the use and conservation of natural forest resources.

Community forestry is a participatory activity encouraged across the world as a successful strategy in promoting sustainable forest management. Community forestry initiatives have made commendable contribution to rural communities like providing new livelihood opportunities and a good source of income. The increasing pressure on forests and the consequent forest degradation has necessitated the need for an effective protection and management of forest resources in Kerala which in turn can be achieved only through people's participation. In such a situation, "JFM program" in Kerala was introduced as "Participatory Forest Management (PFM)" in 1998. Vana Samrakshana Samithies (VSS), an organisation of the forest dependent community was formed as a primary PFM institution in Kerala. These samithies, registered under forest department formed the basic units of the JFM system in Kerala. Various forms of Joint Forest Management institutions apart from VSS currently in action include Adivasi Vana Samrakshana Samithy (AVSS), Eco Development Committee (EDC) and Haritha Samithies (HS). Along with these institutions, Theerasamrakshana Vanavalkarana Samrakshana Samithy in collaboration with Fisheries Department (TVSS) and Joint Forest Management Committees (JFMC) of Attappady Hills Area Development Society (AHADS) played crucial roles in co-managed forestry activities.

In Kerala, Eastern Attappady is an extensive mountain valley which differs from the rest of humid tropical areas mainly because of its rainfall characteristics and geographical location. It is also a rural area which has suffered severe land degradation and is predominantly inhabited by poor tribal population. The hills of Attappady were once thickly forested land. Massive encroachment by outsiders resulted in ecological degradation and deforestation of the area. To decipher this situation, Attappady Hills Area Development Society (AHADS) implemented an eco-restoration project as a participatory action taking into consideration many aspects like soil and water conservation, introduction of agroforestry and income generation to communities. The project was initiated with the involvement of grass root community forestry organizations such as Joint Forest Management Committee (JFMC), Ooru Vikasana Samithies (OVS), and User Associations (UA)

which ensured peoples participation. The JFMCs did creditable work through eco-restoration activities with the involvement of the local population thereby uplifting the livelihood status of the resident population.

On termination of the AHADS project, the JFMC was integrated with VSS a Participatory Forest Management (PFM) instituution, and was put into operation in Eastern Attappady under the aegis of Kerala Forest Department. It was primarily introduced in Agali Forest Range and Attappady Forest Range which came under Mannarkkad Forest Division.

It was on this background that a study was attempted to document the performance of the co-managed forestry activities of JFMC and VSS institutions in Eastern Attappady. The present study was undertaken with the following specific objectives;

1. To study the performance of the co-managed forestry activities.
2. To explore the link between socio-economic variables and variation in members' perceptions about the success of these initiatives.
3. To identify, find and address the various conflicts and potential suggestions for better streamlining the co-managed forestry activities.

Review of literature

REVIEW OF LITERATURE

In recent years, devolution of forest resource management and access rights to local communities has become an important policy tool for many developing countries. Larson and Ribot (2004) observed that, over the last two decades, a profound change has been occurring in the area of forest resource management and countries are atleast partially devolving rights and responsibilities over their forests to the users. Edmonds (2002) opined that the changes in forest policy from the traditional state-managed top-down approach to the bottom-up approach of community level was fuelled by the recognition of the limitations of government agencies in managing forest resources at the local level, that had resulted in high degradation of natural resources and local people's livelihood systems. Many studies have documented the theoretical advantages of resource management by users (Baland and Platteau, 1996; Bardhan, 1993), which show the optimism in the potential of user groups for solving the forest resource management problems. The concept of Joint Forest Management (JFM) had been developed for the sustainable management of forest aiming at devolution of forest management to local users which created a positive link between local users and the officials of forest department. A social fence can be built to protect forest from grazing, fire and illegal logging, and sharing benefits and responsibilities for meeting their livelihood subsistence.

Suh (2014) suggested that the rights-based institutional reforms are essential for promoting community forestry, to control illegal logging and improving the livelihoods of landless forest communities, but it alone is not sufficient for achieving the goals.

2.1. History of forest management in India

History of forest management in India can be classified into six distinct phases as pre-British period (before 1750), early British period (1750-1900), late

British period (1900-1947), post-independence period I (1947-1975), post-independence period II (1975-1985) and post-independence period III (1985 onwards). The period from 1900 to 1985 is marked with emphasis on production, while the periods before 1900 and after 1985 have been marked with conservation efforts (De, 1997).

After independence, forest policies of the government continued both the land tenure regime and the management practices of the British. In particular, the colonial-era paradigm of 'Scientific Forest Management' proceeded well with the 1970's, but, there was little regard for the natural diversity of tree species, as forests were converted to monoculture plantations (Khare *et al.*, 2000).

Traditionally, from the time of initiation of scientific forest management, forest management in India focussed on timber as income generation for the country. Since the onset in 1864, the assertion of state monopoly right and the exclusion of forest communities have marked the organising principles of forest administration in India. The commercial interests in the forests of India started with the establishment of railways in 1853 (Ballabh *et al.*, 2002). This narrow commercial focus on timber led to marginalization of forest dwellers, undermining the tribal culture by institutionalization of narrow forest policy (Chakravarti and Prasad, 1989). Forests of India were managed until recently with a prime objective of revenue generation through timber management, which continued till the 1990s (Rishi, 2002). In the process, the forest dependent communities' rights were marginalized and, moreover, large degraded forest areas were converted to monoculture plantations. Several attempts were introduced to conserve forests through state controlled programs failed as they did not recognize the community's role in forest management. Thus, it is being recognized that the people participation in forest management not only contributes to the regeneration of degraded forest, but also helps in the effective conservation of the forest, apart from meeting the community's subsistence needs (Chavan, 2013). Hence the program of JFM was

initially launched to rehabilitate degraded forests and to share the usufructs from such forests with local communities.

Efforts at involving local people in the management of forest resources has produced encouraging results especially in respect of forest conservation and regeneration in 'Arabari' experiments in West Bengal, Western Ghats and 'Sukhomajri' in Haryana. The forest policy, formulated in 1988 based on these experiences, gave priority to the needs of the forest dependent communities. These were the first recorded case of co-management of forests by Forest Department and village communities in India (Samra *et al.*, 2002).

Realizing the importance of participatory approaches to forest management, the Government of India introduced the concept of Joint Forest Management (JFM) under the National Forest Policy, 1988. To create massive people's movements to increase and protect forest and tree cover to reduce pressure on existing forests and meeting people need sustainably were the important objectives of this Forest Policy (Mukerji, 2004). The policy envisages that, one of the essentials of forest management should be that the forest communities should be motivated to identify themselves with the development and protection of forests from which they derive benefits. The establishment of JFM agreements requires to redefine relationship between the departmental field staffs and the villages through which they can regain their trust and alliances. The community participation in JFM enhanced conservation measures and ensured the livelihood opportunities of the poorer and disadvantaged groups who are dependent on forests for their livelihoods (Hildyard *et al.*, 2001). The policy was followed up in 1990 with guidelines created by the central government for all state governments to implement JFM systems through the transfer of daily forest use and management rights to communities, by maintaining legal control of rights over forests to State Forest Department (Behera and Bhagirath, 2009). This could be done either through pre-existing community forest management institutions or newly created institutions, such as Village Forest Committees (VFCs), Forest Protection Committees (FPCs) and Eco-Development

Committees. JFM cover more than 22 million hectares of forests spread across 28 states of India and union territories and also cover more than 18% of total forest. Forests play an important role in socio-economic and ecological process, therefore effective governance is essential to deal with re-establishment and management challenges in India (Chavan, 2013).

2. 2. STAKEHOLDERS PARTICIPATION IN FOREST MANAGEMENT

In the past, many countries took upon themselves to managing the forest reserves without the involvement of stakeholders, particularly the forest adjacent communities.

2. 2. 1. Stakeholder

Stakeholders are the forest-dependent communities living close to forests, and directly affected by forest management decisions and management activities. Stakeholders as defined by Kotey *et al.* (1998) are, a group of persons and institutions who have a statutory, customary or moral right to use or benefit from the forest, and the power (legal, traditional or moral) to control or regulate conduct and behaviour which has an effect on the forest. All such persons and institutions may be said to have a stake in the forest and hence may be considered to be stakeholders.

2. 2. 2. Stakeholder's participation

Participation means 'a dynamic group processes in which all members of a group contribute, share or are influenced by the interchange of ideas and activities towards problem solving or decision making (Banki, 1981). Santhanam *et al.* (1982), defined participation as commitment on the part of the individual towards all forms of actions by which the individual can 'take part' or 'play a role' in the

operation, without being conscious of any socio-economic barriers to achieve certain common goals in a group situation.

According to Little (1994), participation is an active process whereby beneficiaries or client groups influence the direction and execution of the development or management of a natural resource to enhance their well-being in terms of income, personal growth, self-reliance or other values. World Bank (1996) defined participation as "a process of stakeholders' influence and share control over development initiatives, decisions and resources which affect them".

Based on the wide range of participatory forest management publications, Buchya and Hoverman (2000) reviewed the public participation in natural resource management with specific reference to forest planning. They highlighted that, public participation can be considered by the involvement of stakeholders as an end in itself or as a means to an end and lack of definition and transparency of chosen process and objectives often lead to more problems.

2.2.3. Different types of participation

There are different types of participation ranging from out control, involvement of local people, to a collective action of local people where their own agenda is set and implemented without outside participation. The various types of participation stated by Buttoud (1999) and, Fabricius and Koch (2004) were passive participation, manipulative participation, participation by giving in information, participation by consultancy, participation for material incentives, functional participation, interactive participation, resource participation and self-mobilisation.

Cohen and Uphoff (1980) identified four different kinds of participation. According to this classification, the levels of participation are described as follows:

1. Participation in decision making: In this, level of participation refers to how stakeholders are involved in forest decision and planning processes such as management meetings.
2. Participation in implementation: This describes how stakeholders are voluntarily or involuntarily involved in administration, coordination and contribution with their resources in forest resources management.
3. Participation in benefits sharing: Participation focused on how various stakeholders participate in distribution and sharing of economic or material benefits from the forests.
4. Participation in monitoring: This level of participation refers to involvement of stakeholders in policing and reporting of illegal activities and with the legislation support to do.

Based on the kind of activities in which beneficiaries involve, participation observed at different levels of intensity was measured. Levels of participation were of low intensity, when there is limited information sharing and consultation. When beneficiaries become decision makers or start initiating action on development activity it can be summarised that participation has reached a high level of intensity (Lise, 2000).

2. 3. CO-MANAGED FORESTRY INSTITUTIONS

In India, forest resources are considered as common property resources, offering multiple benefits to the general and rural people. It is linked to the contribution to a substantial volume of rural livelihood, eradication of poverty and maintenance of ecological stability and biodiversity as well as promotion of socio-cultural welfare of rural community. India's National Forest Policy (1988) mentioned the importance of local people's involvement in forest management for achieving improvements in community livelihood and the protection of forests (Behara and Engel, 2006). Following this statement, central government issued guidelines to all state governments to implement Joint Forest Management, as the

largest program in the world by transferring everyday forest use and management rights to the community and the future plan for JFM need to include suitable compensatory mechanism to reduce the poverty of the poorest within a community (Kumar, 2002).

Community based forest management is fundamentally a decentralized grass root movement initiated by the forest communities to protect natural forests from further degradation. This protection movement activity was usually coordinated through traditional or informal culture bound institutions such as Joint Forest Management Committees (JFMCs), Community Forest Management Groups (CFMGs) and Village Forest Protection Committees (VFPCs) etc. Recently, formal types of these institutions had been formed with the support of Forest Department (FD) and Non-Governmental Organizations (NGOs) (Singh, 2002).

Co-managed forestry is an umbrella term describing an alternative to the traditional top-down centralised approach. It is based on sharing with rights and duties, control and decision making authority over forests, between forest department and local users. It also called as Social Forestry, Community Forestry, Joint Forest Management, Participatory Forest Management, Collaborative Forest Management, Leasehold Forestry, and Decentralized Forest management in different countries (Hobley, 1996). These institutions have been proved to be very useful and have also contributed to forest management as well as four aspects of Sustainable Human Development (SHD) namely, ecological output, income generation, village infrastructure development and community empowerment (Prasad and Kant, 2003). Participatory approaches have recently spread all over the developing world with the agenda of rural development and natural resources management. Many developing countries in Asia, Africa, and Latin America have introduced some form of participatory approaches in rural development and natural resource management, including forest management (Sikor and Thanh, 2007; Nelson and Agrawal, 2008).

Consequently, the growing consensus in this regard is to implement a sound community-driven program in natural and environmental resource management that acts to optimize the use of the resource base to enhance agricultural productivity, make sure the long-term sustainability, and protect the livelihoods of poor and vulnerable families (World Bank, 2005). Moreover, the community oriented participatory development program has often been linked to the sustainable livelihoods approach to a variety of different ways of the decentralization of decision-making, the devolution of fiscal responsibility, and local institution building, though the notion of sustainable livelihoods has not necessarily implied a participatory approach in policy-making. Nevertheless, a viable instrument of decentralized natural resource conservation agenda emerges when the design of participatory development program joins with a sustainable livelihoods structure (Das, 2012).

Sarin (1996) opined that community forest management is riddled with immense conflicts and contradictions in India. Community is neither democratic nor equitable particularly in gender aspects in the context of socio-economic changes. The author suggested that, the efforts to empower poor forest dependent women and men to increase their political voice through participation need to be given much greater attention with respect to issues of equity and empowerment of the marginalised. Otherwise the voiceless will continue to lack voice even under community forest management. In the body of participatory development literature, proper management of the common pool natural resource towards its user groups has been deemed one of the most feasible options of rural poverty reduction, socio-economic development and biodiversity conservation in the developing world (Das and Sarker, 2009; Das, 2010). The issue of common property resources management therefore enjoys widespread acceptance in contemporary development thinking and policy-making spheres. Indeed, the effective involvement of communities for managing common natural resources in a sustainable manner is now an internationally-recognized agenda (Das, 2011). The Indian strategy on the sustainable management of common resources like

forestlands has also become an integral part of rural economic development policy in the last two decades.

JFM has now emerged as the most pervading institution conserving forests throughout India with its operation spread over 27 states, and its objective is to ensure protection and preservation of forest land with possible positive impacts on enhancing rural livelihood (Bahuguna, 1997). India's co-managed forestry program is currently distributed in almost all states and covers more than seventeen million hectares of forest lands and spread around 8.5 million families, including indigenous communities (FSI, 2011). Joint Forest Management is the most important initiatives by forest department in partnership with village communities to protect, regenerate and manage forests. This is one of the largest efforts in the world to involve village communities for the objectives of sustainable forest management and providing for the sustainable livelihoods of participating people (Pandey, 2005). Forestland is therefore an indispensable source of livelihood for rural households in the course of their extraction of timber and non-timber forest products, which mainly serve as regular and seasonal income. It is also argued that the rural population of forest fringe areas is reliant on forest resources for their livelihood as well as a way of life both socially and culturally (Sarker and Das, 2006).

2. 4. FACTORS INFLUENCING STAKEHOLDER'S PARTICIPATION

Chopra *et al.* (1990) and Sarin (1995) signalled the importance of people's involvement in forest management. It shows that in many institutional settings of rural India, forests are better managed when voluntary people's participation is secured. The participation is a learning process and greater control by local communities for decision making stages than outsiders (Agrawal, 2001) and played a vital role in meeting the needs of rural communities.

Socio-economic, cultural, political, and institutional policies in developing countries had influenced local people participation in managing forest (Maskey *et al.,* 2003; Agrawal and Gupta, 2005). There are various socio-economic and biophysical factors impacting household participation in community forestry activities. Participation of members in forest management programs may vary according to socio-economic and demographic backgrounds such as age, gender, marital status, education, household size and income, and land tenure status (Maskey *et al.,* 2003). Success of stakeholder's participatory forest management at different management levels such as planning, implementation, monitoring, and benefit sharing are influenced by various factors (Alhassan, 2010). The study also cited that the initial planning phase for meeting to take decisions was influenced by gender and education of stakeholders and the implementation phase and benefit sharing phase were associated with presence of middle aged people and education.

Major problems that community forestry envisages are lack of involvement by women, the poor, under educated and those from lower caste (Pandey, 1999; Lachapelle *et al.,* 2004). Community forestry issues have now been associated with wider socio-economic, environmental and political concerns (Timsina *et al.,* 2004).

Factors that generally motivate people to participate in rural development activities include awareness, education and economic gains (Chandekar and Thomas, 1990). Various studies had focused on factors that are related to social capital (Putman, 1993; Woolcock, 1998) and the socio-economic conditions of individuals (Lise, 2000) that inhibit their effective participation in forest management and conservation.

Putman (1993) defines social capital as "features of social organizations, such as networks, norms, and trust that enable participants to act together more effectively to pursue shared objectives". It is also considered as an important resource for shaping individual's participation in biodiversity conservation. Baral (1993) noted that ethnic composition, political ideology and culture within the

community could create problems at the user group level. Social hierarchies in the form of religion and caste are critical explanatory factors that determine the degree of participation (Deshingkar *et al.,* 2005). Household characteristics, they influence decision-making as to whether or not to participate in forestry programs (Dolisca *et al.,* 2006). However, Kugonza *et al.* (2009) reported that forest dependent communities' participation in forest resources management is not affected by ethnic background and gender. Chhetri *et al.* (2013) found that education level and traditional customs had effect in low participation of social groups, women and individuals from low castes represented in lower levels of participation in decision making process.

The success of community forest management was influenced by some important variables such as tenure security, clear ownership, effective enforcement of rules and regulations, strong leadership with capable local organization, common interests among community members, and local authority (Pagdee *et al.*, 2006). These variables illustrate community forest relationships, community ability to organize and continue collective activities, and protection of benefits, rights and responsibilities in common resource management.

2. 5. CO-MANAGED FORESTRY BENEFITS

2. 5. 1. Co-managed forestry impacts on forests and livelihood status as perceived by stakeholders

Shyamsunder and Parameswarappa (1987) reported that Forest Department often argue that management of forests require certain level of professional training and scientific competence that lie outside the levels of the forest users. Crisis of global deforestation brought about the recognition that forests may better be managed under the community state partnerships. Several management practices initiated to conserve forests without involving the local communities have not met with reasonable success.

Very few studies have been done to assess the impact of JFM on restoration and regeneration of forests, and on the rural livelihoods. Murthy *et al.* (2002) studied five villages undertaking JFM in Uttara Kannada district of Karnataka for assessing regeneration in plantations and nearby natural forests of the village. They observed that, the impact on the forests in terms of stem density varied from village to village and between plantation and natural forests. However, regeneration in all less disturbed forests was better compared to the disturbed counterparts, clearly indicating the impact of joint forest management on regeneration.

Jinlong (1999) and Mahapatra (2000) opined that JFM institutions are fastly emerging as a sustainable way for managing the common pool forest resources around the world. The general findings of impact of community forestry are positive in terms of security of forest product and benefits flows, various household income generating opportunities, support for community infrastructure and development activities, and improved social capital for collective planning and action (Dev *et al.*, 2003). The perception of local people about joint management of the forest, improvements to the livelihood of the community and the ecological condition of the forest in the study done by Phiri *et al.* (2012) observed that, JFM seems to have improved the condition of forest through enhanced natural regeneration. In addition, social status of the local community members played a significant role in their participation in JFM activities. However, the communities did not perceive JFM having improved their livelihood. Therefore, they suggested that future JFM should clearly outline to local communities the mechanisms of benefit sharing.

Community perceptions on the impact of decentralised forest management were assessed by Mbwambo *et al.* (2014). The study observed that forest management under Joint Forest Management (JFM) and Community Based Forest Management (CBFM) had limited the collection of deadwood for fuel and other non-timber forest products because they are essentially protected catchment forests. But, the community perceived that two decentralised approaches have the potential

to meet the general participatory forest management goals of improving forest resource, governance and livelihoods.

Participatory forest management programs are connecting livelihood capitals of the communities which suggest the trend towards changing involvement in income generating activities other than forest related sources, which is a positive impact of participatory forestry and which will reduce the pressure on the adjacent forests. Due to the involvement of the JFM programs, people are feeling much secure, women participants had increased their confidence level in the meeting and decision making programs (Kibria *et al.*, 2014).

2. 6. SUCCESS OF CO MANAGED FORESTRY ACTIVITIES

Over the past two decades, Community Forest Management (CFM) was implemented as participatory approach for achieving the goal of sustainable forest management. It focused on improving the livelihood and welfare of rural people and conservation of natural forests through the participation and cooperation of adjacent community of the forests (Klooster and Masera, 2000). CFM success has been a multi-dimensional concept and integrate outcomes of ecological sustainability, social equity and economic efficiency with an objective of long term use of the resources (Agrawal, 2001; Hanna and Munasinghe, 1995). But it is not an easy task to create a proportionate combination between the three aspects for success.

For success of co-managed forestry, some important factors have been identified from internal attributes of the community such as community size, socio-economic heterogeneity, institutional settings and property right structure, to external influences such as national forest policy, marketing status and technology (Baland and Platteau, 1997). The arrangement of these factors create a positive relationship between the users and resources, in which it is possible to lead the

success of co-managed forestry programs that provides benefits to the community, guarantees their rights, and facilitates responses to changing conditions.

A study on the performance of state-community Joint Forest Management in Andhra Pradesh done by Behera and Bhagirath (2009) indicates that JFM communities are more likely to perform well when they are in small size and when forest resources in the JFM community are scarce. The study also observed that effective protection of forests is likely to promote good forest growth, and JFM communities that were initiated by NGOs are effectively managing the forests than the one initiated by the forest department.

According to Pathan (1994), the determinants of success of a Joint Forest Management are influenced by NGO and traditional leaders, motivation, technical input and strong political will to take the program ahead and local and national interests. A comparison of forest protection and watershed management in three villages of Andhra Pradesh by D'Silva and Pai (2003) identified social capital as an important factor for successful development outcomes at the grass roots in forest protection and watershed development.

2.7. CONSTRAINTS IN OPERATIONALIZING CO-MANAGED FORESTRY

A study on constraints of Joint Forest Management in two villages of Uttarakhand, observed that the lack of cooperation among villages, poor cooperation from forest officials, illegal grazing, damaging boundary wall, illegal cutting of fuel wood and timber, conflict among Village Forest Committee (VFC) members, lack of training intervention and poor follow up by Forest Department are the major hurdles in achieving success through JFM (Mishra *et al.*, 2008). To overcome these constraints a work on capacity building of forest officials as well as VFC members regarding participatory methodologies, democratic leadership, interpersonal communication, conflict management and technical aspect of participatory management is needed.

As per Rastogi (1998) the conflicts in JFM in India have their roots in economic compulsion, sociological stresses, technological intensification, changing consumption pattern, scarce land availability and contending resource users. The present set of rules fails to address these issues comprehensively. The emerging issues of JFM programme implementation are inappropriate mechanism of participation between the parties involved, institutionalisation of JFM programme, lack of clarity about JFM activities, adequacy of benefits to village communities, sustainability of JFM, and integration of JFM and rural development (Pratima and Jattan, 2002).

According to Saigal (2000) forest departments, local communities and NGOs are facing some conflicts in the institutionalisation of JFM. Despite the progress and positive impacts, the JFM program is still in the experimental phase. Latent conflicts related to caste, class, and gender issues are threatening JFM institutions at the village level. Forest Department is also facing a number of internal conflicts as it tries to adjust to its new role under JFM. To resolve these conflicts a much more concerted effort is required along with creation of suitable mechanisms at local, state and national levels.

Matta *et al.* (2005) described the perspectives of Forest Department officers about the India's JFM program. According to foresters, JFM was a radical departure from traditional forest governance, but, corresponding transformation within the forest department has not occurred. The cited reasons were: (1) a target based incentive system that leaves little room for establishing the relationships with local people needed for collaborative management; (2) rigid rules and regulations that prevent the flexibility needed for adaptive, site-specific problem-solving; (3) a hierarchical, top-down style of communication that prevents the upper administration from learning what is happening on the ground and stifles initiative by field staff; (4) the need for a committed leadership to reverse this hierarchical culture. Team-oriented leaders can transform the forest department which makes

participatory forest management success. Moreover the training and reward systems should be changed.

In many cases, forest management planning has no linkages to the ecological system and community. This caused many problems during the co-managed forestry programs. Makarabhirom (1999) did a study in people's participatory forest management and its constraints. Seven constraints of people's participation in sustainable forest management were identified. They are: the state authorities, centralized management decision-making, inappropriate attitude towards people and forest use, lack of trust and strong commitments, lack of knowledge and skills to work with people, uncommunicated incentives, and a lack of legal support. He suggested that the promotion of people's participation in forest management requires concerted efforts from the government, non-government organizations and people. This enhances the human resources in terms of awareness raising, proper attitudes, provides basic needs, generates income and helps to strengthen the capacities of the community in managing forests, natural resources and environment.

The success of co-managed forestry programs depend on the interest of people and development of respectful relationship with Forest Department officials. Rao (2012) suggested that the Forest Department must concentrate on the sustainable works, provide frequent training to the members of JFM institutions. At the same time the Forest Department officials need to maintain cordial and respectful relations with members to enhance their interest towards the success of the programme.

The importance of institutions in influencing success of concept of community forest management was studied by Brown and Lassoie (2010). A key constraint on success identified was the inappropriate institutional structure at the local level with responsibility to manage community forests.

2. 8. WOMEN PARTICIPATION IN FOREST RESOURCE MANAGEMENT

Women in rural India, as in many developing countries, are the primary collectors of forest products used for consumption and to meet livelihood requirements. This gendered vision of labour in which women are the primary uses of forest resources such as fuel, fodder, medicine and non-timber forest products. This indicates that women should be participated in community forest management activities (Maksimowski, 2011). However, many studies shows that, the institutional structures of local governance in India have largely limited the participation of women in forest management activities (Agrawal, 2001; Nanavaty, 1996; Sarin, 1995).

The forest policy of 1988 envisaged both women's and men's participation in the protection of forests. The rules specified that the women should be involved in village management committee in the JFM programme. However, it had not been observed in many cases due to social and cultural constraints. Women play little role in the programme and men are still dominating the decision making programs. Hence, the JFM programs should be more gender sensitive to ensure the active involvement of women. The meetings should be organised at times and places convenient for women to encourage and support their participation.

Ardayfio-Schandorf *et al.* (2007) opined that, the JFM success reversed forest degradation and improved rural livelihoods with the help of forest dependent groups, including women. However, the forestry sector has been slow in providing equal opportunities for women who are critical actors in forestry and natural resources utilization and management and also they are the primary collectors of forest products used for household consumption and sale (Agrawal and Chhatre, 2006).

But many studies indicate that a key issue in JFM and other participatory approaches to community forest management in India is the lack of women's

participation. Study conducted in Orissa by Ostwald and Baral, (2000) found that men particularly from upper caste, has more voice than women in terms of their opinions, attitudes and roles in JFM programs. The National Forest Policy of 1988 clearly mentions that women should be involved in JFM activities and Ministry of Environment and Forests (MoEF) stated that the objectives of JFM was creating a massive people's movement with the involvement of women (Agrawal *et al.*, 2008).

The JFM consists of diverse group of communities differentiated by caste, religion, tribe and ethnicity. It is normally the poorest and marginalised group's highly dependent on forest resources for survival and livelihoods. Even in the all women committees in West Bengal, it is noticed that higher caste and richer women tend to dominate the discussions and decision-making process. In such cases, less powerful women are not involved in process and are not interested to participate (Das, 2011).

2. 9. CO-MANAGED FORESTRY IN KERALA

2. 9. 1. History of forest management

Kerala state formed during the reorganisation of Indian states, comprises the princely states of Travancore, Cochin and Malabar region. This region had a forest and timber tradition from the earliest times. Upto 18th century, three-fourth of the land area of Kerala was under thick forest cover (Karunakaran, 1985). The forest in the state comes under the category of tropical moist forests and the most predominant types are wet evergreen forests and moist deciduous forests in which man-made forestry has a very long history in the state and plantation of the various species account of the forest area.

A historical analysis of state forest can describe the changes during the two specific periods, namely: Pre-1947 era, and Post-1947 period. During the former period, trade was the main source of income of the state, and to monopolize trade

in several important items a commercial department was formed. The post 1947 period was characterized by the joining the princely states into the Indian union and transfer of power to democratically elected governments. The elected government of the state has two important considerations, which are meetings the needs of agricultural sector, and enhancing government income to meet growing expenditure of developmental works (FAO, 1984).

According to Chundamannil, (1993), there were three broad phases in the history of forest management in Kerala, period of rise of forestry (1840-1940), period of turbulence and change (1940-1980), and the ascent of conservation (1980 onwards). The rise of forestry was marked by the realisation of the importance of Kerala for supply to British navy. Forestry was aimed at commercial exploitation of teak in forests. The major achievements during this period are the reservation of forests, the perfecting of teak planting techniques and initiation of systematic management by working plans. During the period of turbulence and change, efforts at mechanisation of logging and opening up of forest for food crop cultivation according to the working plans were made. The period of ascent of conservation describe the restriction on clear felling and stopping of selection felling. This arrested the earlier trend of forest degradation. The Wildlife Protection Act 1972 and the Forest Conservation Act 1980 are the major events in this period.

2. 9. 2. Participatory Forest Management

India's national forest policy 1988 and the circular on joint forest management issued later in 1990 envisages people involvement in forest protection, development and management of forests. Accordingly Government of India had issued guidelines for involving village communities and voluntary agencies in regeneration of degraded forestlands and protection of remaining natural forest of the country. The state governments were also requested to take appropriate action along the suggested lines (Bahuguna, 2004).

The concept of Joint Forest Management was expanded to the states of India in the early 1990s, but in Kerala, it was established in 1998 with a synonym "Participatory Forest Management (PFM)". The term JFM is applied to the national level and PFM is used in the context of Kerala (Masuda *et al.*, 2005).

Participatory Forest Management institutions are called Vana Samrakshana Samithies (VSS) under the Forest Development Agencies (FDA). VSS is a society of forest dependent community living around the forest with an elected president from local community and a forest guard or forester as its secretary (KFWD, 2008). VSS formed with an objective of protection of degraded forests has taken up conservation activities under long term agreements and providing employment opportunities and to share the benefits of forest produce to the VSS members. The 'VSS' is an institution at the village level for the protection of the forest area adjacent to their village boundary (Singh, 2002) and also responsible for preventing forest fires, illegal felling etc. They share benefits for increasing their livelihood income through sale of Non-Timber Forest Produce (NTFP) and ecotourism activities.

The Kerala State Planning Board conducted a study on Joint Forest Management by three selected VSS in the southern circle of Kerala Forest Department (KSPB, 2004). The study was identify the factors for the success of VSS such as good community relationship, change in the attitude of forest department officials, sensitisation of the communities, fire protection and the role of non-government individuals as critical factors. The factors that retard the progress were diverse interests of communal and political groups.

Masuda *et al.* (2005) conducted another study on VSS in Kerala, they suggested that the guidelines of the central government needs to be duly modified to meet the local conditions. They suggested that common practices of agroforestry on the farmlands in Kerala naturally decreased the pressure on forest resources. Hence, they recommended that agroforestry could be an alternative to deforestation

caused by subsistence activities and using non-forest land tree crops for firewood is another solution of forest issues.

A study was done by Santhoshkumar (2008) in Attappady and Wayanad districts of Kerala to analyse the Joint Forest Management institutions towards forest management, and their impact and constraints of operations. The result from both sites showed that, JFM people perceived a reduction in forest degradation activities, JFM activities had positively influenced the attitude towards forest and forest department, and majority of participants were aware of forest laws after implementation of JFM. The study identified a few limitations in the rules like lack of legislation, asymmetric power structure, lack of functional linkages between other developmental departments etc. which needs to be solved through institutional reforms. In addition, the major significant constraints according to officials of forest department are the increased work load created by JFM, lack of training, frequent transfers of the secretary of the committee, delay of fund and excessive political interference.

Materials and Methods

MATERIALS AND METHODS

3.1.STUDY AREA

3.1.1. Location

Attappady, situated in Mannarkkad taluk of Palakkad district, is located 10^0 55`10`` and $11^0$ 14` 19``North latitude and between 76^0 27`11`` to $76^0$ 48`8`` East longitudes. Attappady is an area of undulating terrain, a valley sandwiched between Nilgiri hill ranges and Vellingiri ranges to the south (both having an elevation of over 1200 meters). The total area of 745.59 km^2 spread over three panchayats namely Agali, Pudur and Sholayur lying at Western Ghat ranges with forest cover over 444 km^2.

3.1.2. Boundaries

Attappady is an extensive mountain valley at the headwaters of the Bhavani River below the Nilgiri hills of the Western Ghats. It is bordered to the East by Coimbatore district in Tamil Nadu, on the North by the Nilgiris, South by the Palakkad taluk and on the West by Mannarkad taluk of the Palakkad district and Ernad taluk of the Malappuram district. The 249 km^2 Attappady reserve forest is an informal buffer zone bordering the Silent Valley National Park to the West.

3.1.3. Topography

Attappady block is distinctly separate in all aspects from the rest of the district in terms of topography, climate, agriculture and demography. The average elevation of Attappady is 550 m with the highest point being Malleeswaran peak (1664 m). Due to geographical reasons, Attappady plateau shows climatic variations, which is evident from its rainfall regimes. The Western regions receive above 3000 mm per year while Eastern margins (rain shadow region) receive less

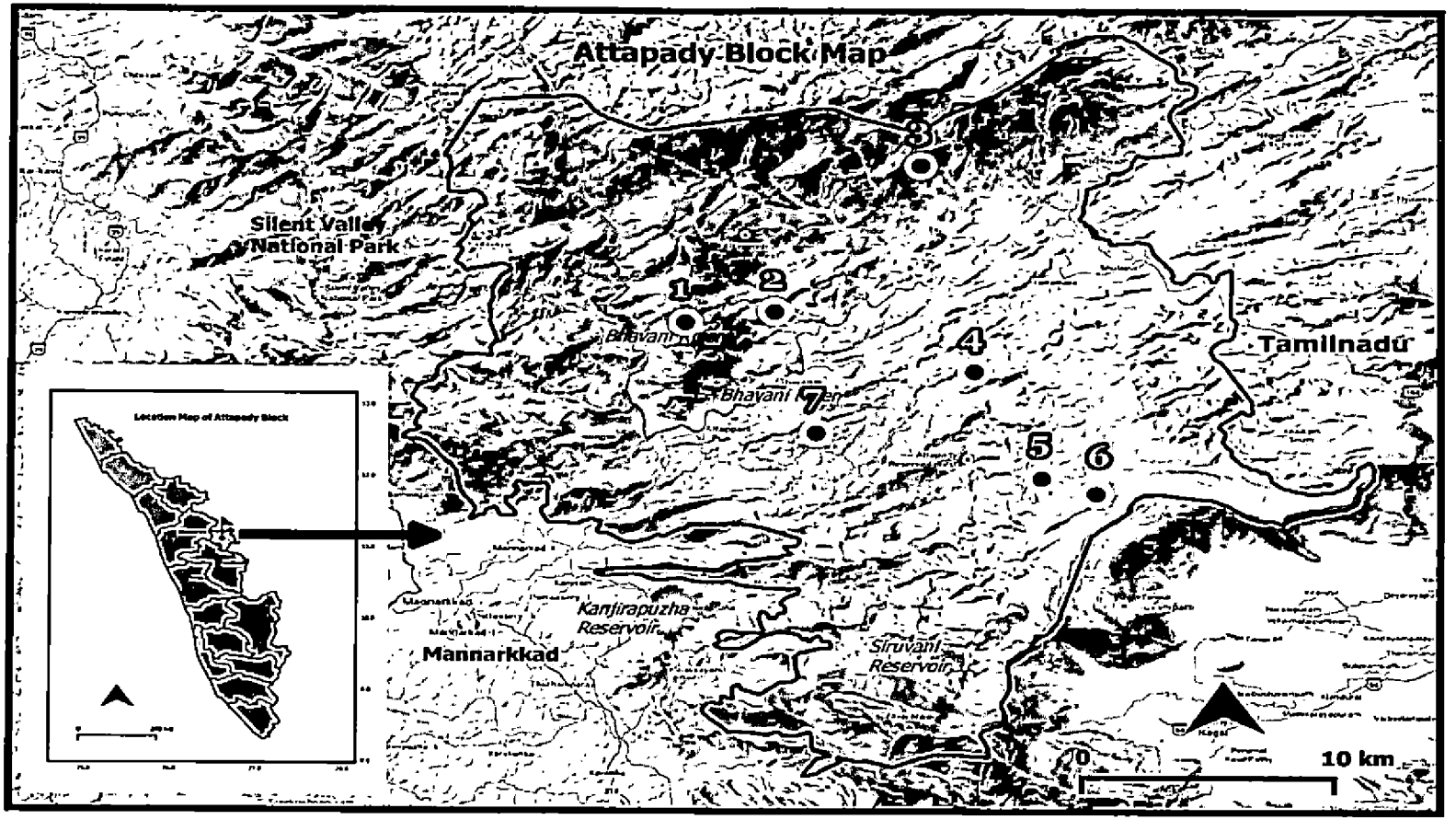


Fig. 1 Study area map of Eastern Attappady

LEGEND

1. Paloor
2. Bhomiampady
3. Puthur
4. Sambarcode
5. Gonjiyur
6. Sholayur
7. Kalkandy

than 1000 mm per year (KSPB, 2005). Erratic pattern of rainfall, loose soils lacking in moisture, less vegetal cover, un-scientific tree cutting, agricultural practices etc. have rendered these lands an erosional landscape which paved way for slow desertification (KIRTADS, 1982). The major river systems draining the plateau are Bhavani, Siruvani, Varagar, Kodangarapallam and Kunthipuzha.

3.1.4. Demography

Attappady is the only tribal block in Kerala. According to the 2011 census, the number of settlers had climbed to 67,672 (66%) of Attappady's population of 98,330 compared to the 30,658 Scheduled Tribes. There are nearly 180 tribal hamlets in Attappady (Census of India, 2011). In 1951, the population of Scheduled Tribes was recorded as 10,200 (90.26%) of the total population in Attappady. Settlers or non-tribes on the other hand, comprised a mere 1,100 (9.74%). However, in 1961 tribals who constituted a majority of the population, had become a minority by 1971 due to the mass influx of settlers from both Kerala and adjoining state of Tamil Nadu (AHADS Hamlet Survey, 2002). Tribal hamlets of Attappady are found in all the three panchayats, namely, Agali, Pudur and Sholayur. The population of the valley mostly belongs to Muduga, Irula and Kurumba tribal community people. Kurumbas are primitive tribes of the district. It was an almost exclusively tribal dominated area, inhibited by these distinct tribal communities. Traditional systems of governance along with the kinship ties which had maintained the cohesiveness of the tribal hamlets have weakened.

3.1.5. Agriculture

The traditional economy of Attappady depends mainly on land and forest. The land was traditionally cultivated with jower, millet, ragi, red gram, mustard black gram, grain amaranth, cotton, ground nut and black gram under rainfed system. Land utilization pattern of Attappady drastically changed since 1950's, the mass flow of settlers both from Kerala and adjoining state of Tamil Nadu. The

settlers from the plains began occupying rich, fertile valleys and converted to agricultural lands. The change in agriculture has been towards more of cash crops in place of tribal agriculture being practiced till then. Introduction of different styles of farming to the area, unknown to its original inhabitants, distorted and ruined the 'low-technology agriculture' of the indigenous people. A wide variety of cropping systems emerged displacing indigenous cultivation. The migrants from the low land who were culturally and technologically more advanced than the natives overpowered and disposed them. The organised land grabbing by the non-tribals and the resultant land alienation of the past six decades has removed from the tribals much of the fertile cultivable land. Continuing land alienation has transformed their once prosperous agricultural systems in to a relic of the past.

3.1.6. History of forest management

The area was once heavily forested. Over-exploitation and improper management of natural resources coupled with faulty land use practices turned Attappady into a totally degraded zone of the Western Ghats region. It is the combination of climatic and anthropological factors that caused severe damage to the ecology of the area and the livelihood support systems of the people. Massive encroachment of forest and cultivated lands, introduction of unsustainable cropping systems, and excessive grazing inflicted heavy damage to the ecosystem. Due to deforestation of the catchments, perennial rivers dried up, springs disappeared and water quality worsened considerably, leading to diseases, ill health and starvation of the tribal people. Extensive felling of trees and the tillage along the slopes with bullock carts led to increased soil erosion, runoff and depletion of groundwater. Along with this even more unsustainable practices such as brick making using the thin topsoil became a regular practice in Eastern Attappady.

3.2. SELECTION OF SAMPLE

Three Joint Forest Management Committees (JFMC) and four Vana Samrakshana Samithies (VSS) were randomly selected from the study site.

3.2.1. Joint Forest Management Committees

Joint Forest Management Committee (JFMC), a co-managed forestry institution, was implemented by Attappady Hills Area Development Society (AHADS) as part of Attappady Wasteland Comprehensive Environmental Conservation (AWCECOP) Project. This institution is formed under the guidelines of VSS. It was a sub group of User Associations (UA) formed on a watershed basis by throughout the area, and financial support and technical facilities were given by AHADS. There were 54 JFMCs under the project, which registered with the Divisional Forest Office. JFMCs were led by a nine member Executive Committee, priority was given to SC/ST members. JFMCs' programme was intended to control deforestation and degradation activities such as forest fire, cattle grazing, uncontrolled exploitation of trees and other forest produce, encroachment of forest, illegal transportation of timber, poaching and other human interventions. The participants and beneficiaries are those people who depend on forest and forest produce for their livelihood.

3.2.2. Vana Samrakshana Samithies

Joint Forest Management is popularly called Participatory Forest Management (PFM) in Kerala. It was implemented with the objectives of developing appropriate participatory approaches to forest management in different forestry and socio-economic contexts and, to introduce and sustain it in all such areas inside as well as outside forests. Vana Samrakshana Samithies (VSS) are institutions formed under this concept at present in Kerala. VSS formed as the basic organisation for implementation of JFM in the territorial division of Kerala. It is a

community organisation, comprising of Forest Department and local people living in and around the forest areas, responsible for forest protection, management and community development. The functions of VSS are also including the link between Forest Department and forest users. The basic form of VSS is also referred to Fringe VSS to denote the fact that they are composed of forest dependent community without any regard to caste. Forest areas in territorial divisions are brought under JFM so that forest would continue to meet basic community needs of the locality while at the same time improving the forest cover.

3.2.3. Selection of respondents for the study

The total sample size of the study was 183 respondents comprising 120 households from four VSS units and 63 households from three JFMC units and they were selected randomly (Tables 1 and 2).

Table 1. Sample size of the study area

Sl. No.	Co-managed forestry institutions	Surveyed units	Number of respondents
1.	VSS	4	120
2.	JFMC	3	63
Total		7	183

3.2.4. Data collection

3.2.4.1 *Questionnaire Survey*

A detailed interview schedule was prepared to gather information from stakeholders and officials of Forest Department as well as AHADS. Household survey was conducted by using a pre-tested structured schedule (Appendix I) to obtain data of the general characteristics of each household as well as to understand

the respondent's knowledge about forests and forest resource utilization, and their perception about co-managed forestry activities. In order to meet the objectives and to answer the research problems, the questionnaire designed under two parts.

Part one: **Demography**: This section identified factors such as age, gender, income, occupation, landholding size, education, house types and social participation. These factors using for analyse the socio-economic status of the respondents.

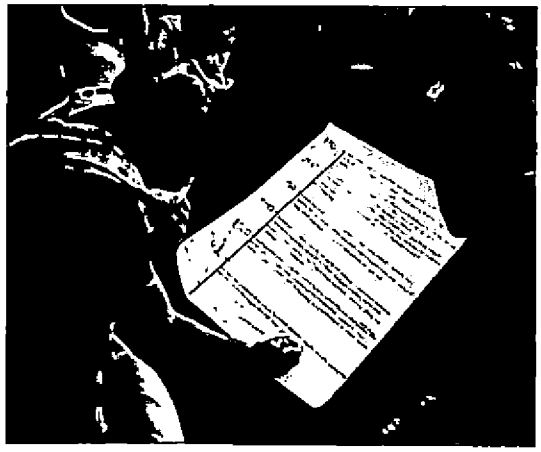
Part two: **Perception of the respondents**: This section of the schedule made use of open ended questions that were directly related to individual perceptions about forest and co-managed activities and the performance of the co-managed forestry activities undertaken the area.

Table. 2 Co-managed forestry institutions of the study area

Sl. No.	Name of the JFMC/VSS	Organising authority	Forest Range	Division	Year of establishment
1	Sambarkode JFMC	AHADS	Attappady	Mannarkkad	2001
2	Bhomiyampadi JFMC	AHADS	Attappady	Mannarkkad	2001
3	Sholayur JFMC	AHADS	Agali	Mannarkkad	2001
4	Moolakombu VSS	KFD	Attappady	Mannarkkad	2002
5	Kallamala VSS	KFD	Agali	Mannarkkad	2002
6	Dhanym VSS	KFD	Attappady	Mannarkkad	2004
7	Sholayur VSS	KFD	Agali	Mannarkkad	2012

Plate 1. Data collection exercises

Questionnaire survey



Participatory Rural Appraisal

Plate 1. Data collection exercises

Questionnaire survey

Participatory Rural Appraisal

3.2.4.2. *Participatory Rural Appraisal (PRA)*

PRA approach is a grouping activity with an aim of obtaining data with better quality than those are normally obtained through questionnaire surveys. Moreover, PRA techniques collect and analyse data more quickly, efficiently and cost-effectively than the conventional questionnaire methods (Waters-Bayer and Bayer, 1994 and Mukherjee, 2002).

In addition, participants' perceptions on co-management and its performance were also analysed by various PRA tools. The performance and conflicts of co-managed forestry activities were analysed using the tools such as Timeline, Venn diagram, SWOC analysis and Problem-causes linkages in consultation with experts. The tools are explained here under;

1. **Time line**

Historical narration of events, their impact and changes can differ across participants depending on their perceptions, and it is useful to keep track of the broad time-period to which they refer to rather than specific dates. Time line provides indications of changes in land use, in community preferences, in community problems, in socio-economic changes, changes in biodiversity, land use, water and other developmental activities. Important events/changes of recent and not so recent origin, having an important bearing on the local community, can be discussed with a group of elderly community members and their time periods can be identified by the members in that process. This helps in contextualizing any relevant issue through a chain of events and provides a historical perspective to the same.

In order to construct a time line, one sits with elderly men and women in a community who slowly try to reconstruct the historical pattern of changes in different variables that have been take place in their locality/community. They may

or may not be able to state the precise time/year of such changes but they are generally able to connect such changes with major historical events, whether political, economic or social. The present study identified the different time periods of major events/ activities in Eastern Attappady.

2. Venn diagram

Venn diagram or "Chappati" diagram is a visual methods to represent the role of individuals/ institutions and the degree of their importance in decision making. In such diagram circles of different size represent an individual or an institution, whose size shows its degree of importance in decision-making in a local community and the overlapping of circles indicates the extent of interaction. If the circles are separate, the institutions have no contact and if they touch each other there is information passing between institutions. The strong or weak linkages between two institutions represented by two circles can also be shown by steady, broken lines or arrows.

Venn diagrams can be useful in the study of relationship of institutions and individuals with local communities. For the local community members Venn diagrams would reflect the kind of communication between the local community and different organizations including governmental organizations and NGOs. The present study identified the relationship between communities and various institutions (Forest Department, NGO, Bank, Politicians, JFMC, VSS, Agriculture Department, Self-help groups and AHADS) and to focus their contributions and activities to community development.

3. SWOC analysis

Explain the Strength, Weakness, Opportunities and Challenges of the VSS and JFMC groups. This analysis can focus on performance of co-managed activities

and its benefits in community members through the participation, suggestions to overcome weakness and challenges.

4. **Problem-causes linkages**

In this method local people list and describe a set of problems and the associated opportunities. The deepen analysis of the main problems in a village or community by revealing how problems, causes and effects are linked to each other and to identify possible solutions.

3.3. DATA ANALYSIS

3.3.1. Description of variables

3.3.1.1. *Measuring dependent variables*

The maximum response of each statement about the performance of co-managed forestry activities of JFMC and VSS were assessed using a Likert scale (Four point continuum) to indicate peoples' response towards each statement. The statements were rated using the four point rating scale viz; (Strongly agree, Agree, Disagree and Strongly disagree).

3.3.1.2. *Measuring independent variables*

Age

Age was operationally defined as "the number of years completed at the time of study."

Monthly income

This was defined as "the amount in rupees that the respondent earns in a month from different sources". This was quantified by using scores

Sl. No.	Category of response	Assigned score
1	Below Rs. 1,000	1
2	Rs. 1,000-2,500	2
3	Rs. 2,500-5,000	3
4	Rs. 5,000-10,000	4
5	Above Rs. 10,000	5

Socio-economic status

Socio-economic status was operationalized as "the position a respondent occupies in the community with reference to his/her occupation, landholding, education, house types and social participation."

Occupation

This variable was operationally defined as "the vocation from which the respondent derives major part of the income". The scoring pattern was as follows;

Sl. No.	Category of response	Assigned score
1	No gainful occupation	0
2	Farming	1
3	Employee	2
4	Business	3
5	Daily wages	4

Land holding size

This was defined as "the size of the land holding held by the respondent," and the scores were assigned as follows;

Sl. No.	Category of response	Assigned score
1	Landless	0
2	Small (< 1ha)	1
3	Medium (1.1 - 2 ha)	2
4	Large (> 2 ha)	3

Education

Education indicated the level of formal education of the respondent, which was quantified in the following manner

Sl. No.	Category of response	Assigned score
1	No formal education	0
2	Up to primary school	1
3	Upper primary school	2
4	High school	3
5	Plus two	4
6	College and above	5

3.3.2. Statistical analysis

Primary quantitative data were subjected to statistical analysis by interpreting the questionnaire responses using computerized means of comparisons and descriptive statistics. The statistical software SPSS (v 20) was used for the statistical analysis.

Results

RESULTS

The present study was undertaken to obtain information about the performance of two co-managed forestry activities, JFMC and VSS, from the perspectives of stakeholders in Eastern Attappady, Kerala. The study also attempted to explore the link between socio-economic variables and the variation in member's perceptions about the success of these two initiatives. The results of these interventions are outlined below.

4.1. SOCIO-DEMOGRAPHIC CHARACTERISTICS OF STAKEHOLDERS

The study sample consisted of respondents randomly drawn from three Joint Forest Management Committees (JFMCs) and four Vana Samrakshana Samithies (VSS) from seven locations namely Sambarcode, Paloor, Kalkandy, Puthur, Bhomiampady, Sholayur, and Gonjiyur in Eastern Attappady. A total of 183 respondents were interviewed, of which, 39.7 per cent were males and 60.3 per cent were females. The respondents were classified on the basis of gender, age, monthly income, occupation, landholding size, education, type of houses and social participation. The details of the study sample with their profile are presented in Appendix II.

4.1.1. Socio-demographic characteristics of JFMC members

The primary data on the socio-demographic characteristics of JFMC members of Eastern Attappady were obtained through pre-tested questionnaire survey. Out of the total 183 respondents surveyed, 63 respondents were associated with the JFMC institution. The details of the social and demographic aspects of these 63 respondents are outlined below.

Age profile

The age of the JFMC members ranged from 25 to 65 years with an average age of 45 years (Fig. 2 and Table 3). The majority of the JFMC members were between the age group of 36 to 50, followed by persons between 26 to 35 constituting 52.4 per cent and 30.2 per cent respectively.

Table 3. Gender and age profile of JFMC members

Sl. No.	Age class (Years)	Male (%)	Female (%)	Total (%)
1	<25	4	10.5	7.9
2	26-35	24	34.5	30.2
3	36-50	64	44.5	52.4
4	51-65	8	10.5	9.5
Total		39.7	60.3	100

Persons younger than 25 years constituted 7.9 per cent, while the members between 51 to 65 age group constituted 9.5 per cent. In the age group of 36 to 50, there were more males (64%), than the females (44.5%). Conversely in the age group 26 to 35, there were more females (34.5%) than the males (24%).

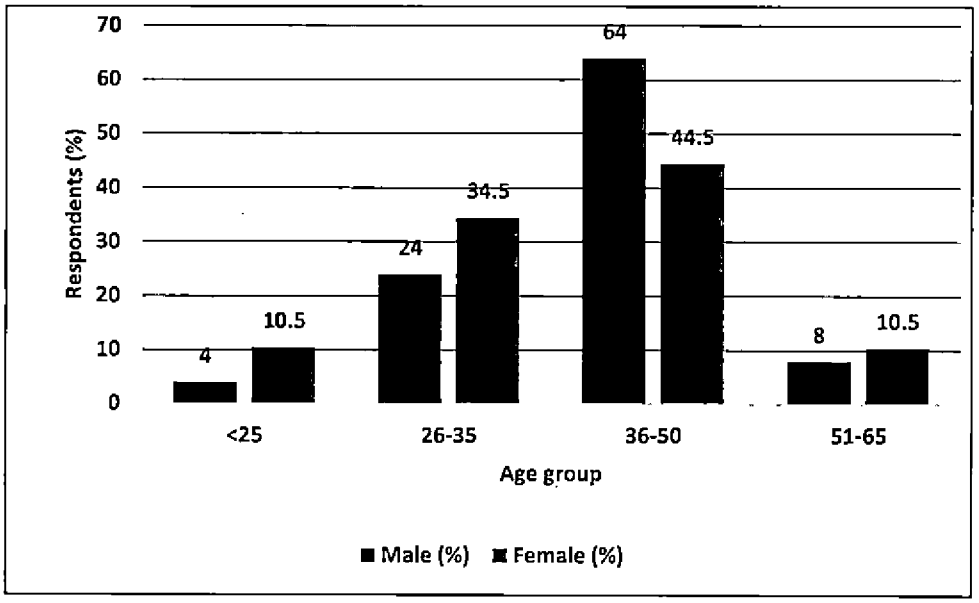


Fig.2 Gender and age profile of JFMC members

Educational profile

The majority of the JFMC members had high school education (35%), followed by those with upper primary school education (27%), primary school education (13%) and plus two education level (6%). Nineteen per cent of the JFMC members had no formal education and none of the members had college level education (Fig. 3).

Major income sources

Only 3.2 per cent of the JFMC members are employed in government services. The majority of the respondents were daily wage labourers (63.5%), followed by those engaged in farming (25.4%). None of the respondents were engaged in business activities (Table 4).

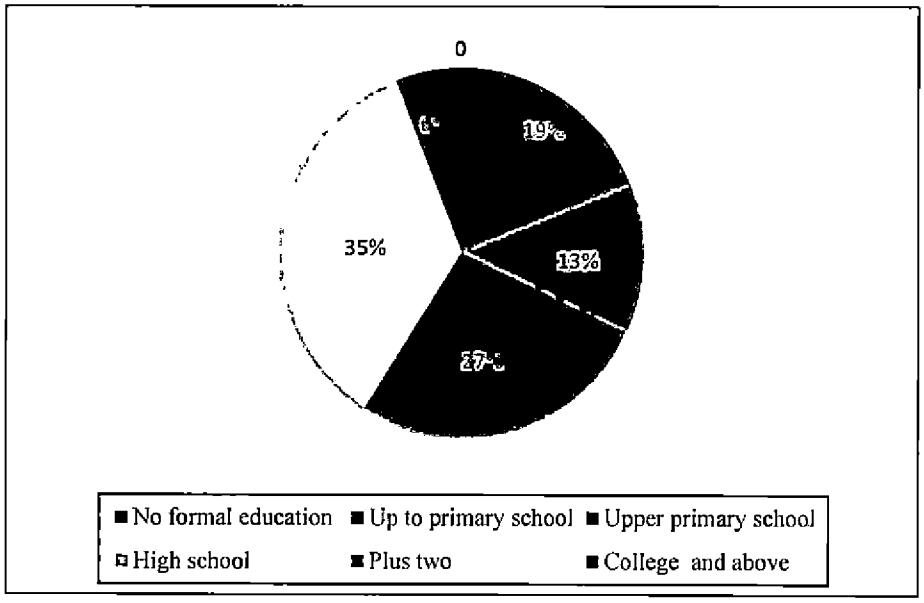


Fig.3 Educational profile of JFMC members

Table 4. Employment status of JFMC members

Sl. No.	Source of income	Members (%)
1	No gainful occupation	7.9
2	Farming	25.4
3	Employee	3.2
4	Business	0
5	Daily wages	63.5

Income status of households

The assessment of income status of the JFMC members showed that 42.6 per cent of the households having a monthly income between Rs. 2,500 to Rs. 5,000. This was followed by those earning between Rs. 1,000 to Rs. 2,500 (22.6%). More than 20 per cent of the households had a monthly income above Rs. 5,000 (Table 5).

Table 5. Monthly income status of JFMC households

Sl. No.	Monthly income (Rs.)	Households (%)
1	<1,000	13.9
2	1,000-2,500	22.6
3	2,500-5,000	42.6
4	5,000-10,000	15.9
5	>10,000	5

House types

The study about the type of houses of the JFMC members revealed that, out of 63 households, 39.7 per cent living in brick walled houses (Table 6). Concrete houses accounted only 31.7 per cent and remaining JFMC members had mud walled and thatched houses (28.6%).

Table 6. House type details of JFMC households

Sl. No.	House types	Households (%)
1	Shed thatched	0
2	Mud walled and thatched	28.6
3	Brick walled	39.7
4	Concrete house	31.7

Land holding size

Table 7. Land holding size of JFMC households

Sl. No.	Land size (Hectares)	Households (%)
1	Landless	11.1
2	Small (< 1 ha)	33.4
3	Medium (1.1-2 ha)	29.6
4	Large (> 2 ha)	25.9

Majority of respondents were small landholders (33.4%) with a landholding size less than one hectare. About 29.6 per cent were comparatively medium landholders with area up to two hectares, followed by large landholders (25.9%). At the same time, 11.1 per cent respondents were landless (Table 7).

4.1.2. Socio-demographic characteristics of VSS respondents

The primary data on the socio-demographic characteristics of VSS members of Eastern Attappady revealed that of the total 183 respondents, 120 were associated with the VSS institution. The details of the social and demographic aspects of these 120 respondents are outlined below.

Age profile

The age of the VSS members ranged from 25 to 65 years with an average age of 45 years. The majority of the members were between the age group of 36 to 50, followed by persons between 26 to 35; both constituting 50 per cent and 35.8 per cent respectively (Table 8). Persons younger than 25 years constituted 2.5 per cent, while members between 51 to 65 age group constituted 11.7 per cent. In the age group of 36 to 50, there were more males (56.7%), than the females (41.5%).

Conversely in the age group 26 to 35 (Fig. 4), there were more females (47.1%) than males (26.8%).

Table 8. Gender and age profile of VSS members

Sl. No.	Age class (Years)	Male (%)	Female (%)	Total (%)
1	<25	3	1.8	2.5
2	26-35	26.8	47.1	35.8
3	36-50	56.7	41.5	50
4	51-65	13.5	9.6	11.7
	Total	55.8	44.2	100

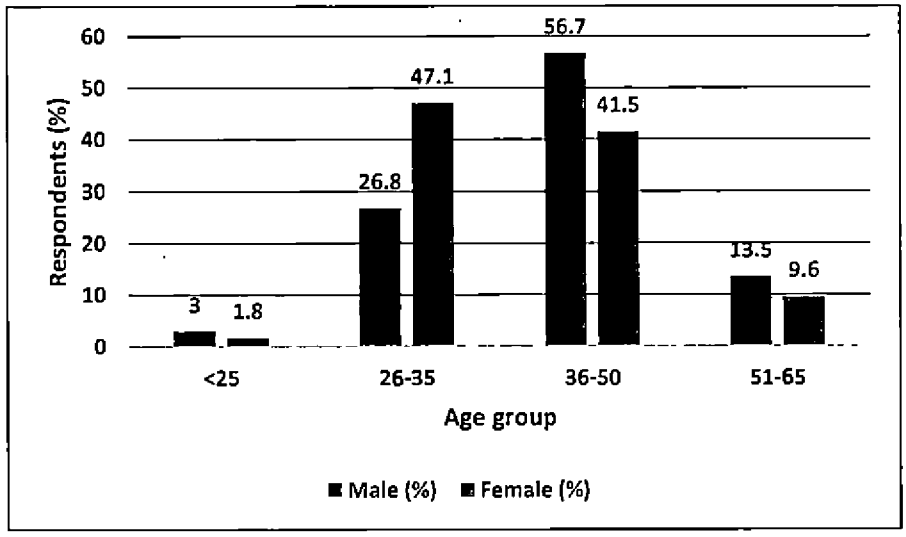


Fig.4.Gender and age profile of VSS members

Educational profile

Majority of the VSS members had high school education (38%), followed by those with upper primary school education (21%), primary school education (16%) and plus two education level (6%). Two per cent of the VSS members had

college level education, whereas 17 per cent of the VSS members had no formal education at all (Fig. 5).

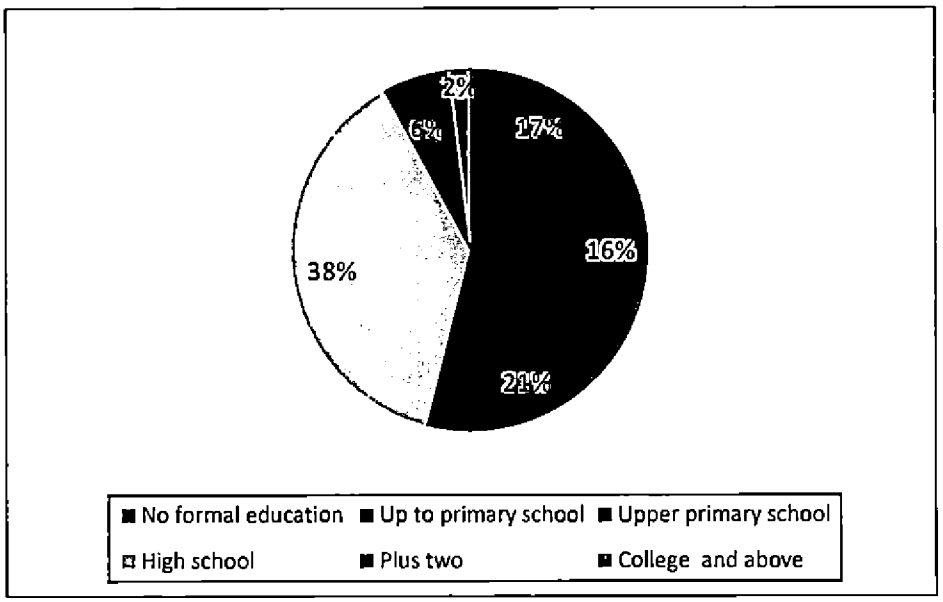


Fig.5 Educational level of VSS members

Major income sources

The majority of the VSS members as daily wage labourers (70.8%), followed by those engaged in farming (11.7%). Only 10 per cent was employed in government services (Table 9). None of the members were engaged in business activities. A few had not gained occupation (7.5%).

Table 9. Employment status of VSS members

Sl. No.	Employment status	Members (%)
1	No gainful occupation	7.5
2	Farming	11.7
3	Employee	10
4	Business	0
5	Daily wages	70.8

Income status of households

The assessment of income status of the VSS members showed that 43.9 per cent of the households to be having monthly income between Rs. 2,500 to Rs. 5,000. This was followed by those earning between Rs. 1,000 to Rs. 2,500 (24.2%). More than 20 per cent of the households had a monthly income above Rs. 5,000 (Table 10).

Table 10. Income status of VSS households

Sl. No.	Monthly income (Rs)	Households (%)
1	<1,000	11.7
2	1,000 - 2,500	24.2
3	2,500 - 5,000	43.9
4	5,000 - 10,000	14.2
5	>10,000	6

House types

Table 11. House types of VSS members

Sl. No.	House types	Households (%)
1	Shed thatched	0
2	Mud walled and thatched	11.7
3	Brick walled	49.1
4	Concrete house	39.2

The study about the types of houses of the VSS members revealed that, out of 120 households, 49.1 per cent lived in brick walled houses (Table 11). Concrete

houses accounted for only 39.2 per cent and remaining VSS members had mud walled and thatched houses (11.7%) (Fig. 10).

Land holding size

Majority of VSS members were medium landholders (36.1%) with a land size up to two hectares. About 25.6 per cent were small landholders with area less than one hectare followed by large landholders (30.5%). But, 7.8 per cent were landless (Table 12).

Table 12. Land holding size of VSS households

Sl. No.	**Land holding size (Hectares)**	**Households (%)**
1	Landless	7.8
2	Small (< 1 ha)	25.6
3	Medium (1.1 - 2 ha)	36.1
4	Large (> 2 ha)	30.5

4.2. HISTORY OF MAJOR EVENTS IN ATTAPPADY

The time line revealed the history of the Attappady and the progress of the area which is presented in Table 13. The hills of Attappady were once a forest land in Kerala. Settlement of immigrants in Attappady started in 1930s and increased during 1940s resulted in massive removal of the forest vegetation. The land use pattern then changed to agriculture. The respondents said that, there were few developmental projects introduced by government and Non-Government Organisations (NGOs) to improve the ecological and socio-economic status of Attappady.

Table 13. Time line of major events of Attappady

YEAR	EVENTS
Early 20th Century	Thick forest, heavy rainfall and main occupation was agriculture
1930	Started the immigration of settlers from Kerala and adjoining state of Tamil Nadu. Occupying rich and fertile valleys, and converted to agricultural lands
1940	**Deforestation started**
1950	Clear felling of the tracts surrounding Vechapathy, Gonjiyur, Varagampady
1951	Tribal population - 90.27%
1957	**Attappady had witnessed massive removal of the forest vegetation. This continued even after the state re-organization**
1961	Tribal population - 60.44%
1962	Attappady declared as a Tribal Development Block
1966	**Kundha River Valley project was introduced**
1968	Attappady divided into three panchayats- Agali, Pudur and Sholayoor
1975	Tribal Block declared as ITDP (Integrated Tribal Development Project)
1976	Agriculture office established
1985	**" Krishnavanam" project as an afforestation programme introduced by PrakrithiSamrakshanaSamithi (NGO) in Bhomiampady**

Table continued…

YEAR	EVENTS
1990	Attappady with absolute backwardness and poverty with more than eight percent population living below poverty line
1991	Tribal population-27.03%
1993	**Malliswara Project was initiated by Prakrithi Samrakshana Samithi (Afforestation programme)**
1993	Employment generation progrmmes- Jawahar RozgarYojana and Employement Assurance Scheme
1994	Check dam in Sholayur hamlet
1996	**Attappady Wasteland Comprehensive Environment Conservation Project (AWCECP) was a scheme implemented with Japanese Overseas Economic Co-operation Fund**
2001	Joint Forest Management Committee (JFMC) established. There were 54 JFMCs under the project
2002	Project implementation was started
2002	Federation of village forest communities registered under Forest department. Participatory forest management was implemented
2002	**Vana Samrakshana Samithies (VSS) started in Mannarkkad forest division**
2002 - 2008	Forest regeneration works completed, seedlings raised by PIs for the afforestation works, controlled soil erosion, improved water availability
2002 - 2012	Overall development of Attappady changes in social, economic, environmental and health sector, job opportunities were increased due to AHADS and NREGS
2012	AHADS project completed and also stopped JFMC activities

Deforestation

Major Participatory Forest Management (PFM) and Eco-restoration programs in Eastern Attappady

The Kundha River Valley Project was introduced in Attappady in 1966, to conserve soil and moisture as well as to prevent siltation of the Kundha dam. In 1985, another participatory afforestation programme called "Krishnavanam Project" introduced in Bhomiampady by Prakrithi Samrakshana Samithi (NGO). The project aimed not only to aware local people against sending cattle for grazing but also to raise and plant local tree species with the help of local people. The positive impact of this project was the forest regenerated in that area within ten years.

Malliswara Project started in 1993 based on participatory forest management programme. The project was initiated with the objectives of fire protection, seedling raising, and digging of pits for soil and moisture conservation.

Attappady Wasteland Comprehensive Environmental Conservation Project under AHADS organisation was a lately formed for eco-restoration project (1996). The project implemented with the objectives of eco-restoration of wasteland and promote sustainable methods of livelihoods of local people. The restoration activities of the project was implemented using participatory approach through people institutions. Joint Forest Management Committee (JFMC), a people institution was formed in 2002 as part of this project for the reforestation of degraded land. Project period completed in 2012 and thereby the JFMC activities had stopped. In 2012, all JFMC institutions were integrated with Vana Samrakshana Samithies (VSS) under Kerala Forest Department. VSS is a Participatory Forest Management (PFM) institution introduced in Agali and Attappady Forest Ranges in 2002 through the local people participation with the objectives of protection and management of forest and improvement of livelihoods of local people.

4.3. PERFORMANCE OF CO-MANAGED FORESTRY ACTIVITIES FROM THE PERSPECTIVES OF MEMBERS OF JFMC AND VSS

A total of sixteen statements on three aspects (ecological, socio-economic and forest protection aspects) were employed for evaluating the performance of co-

managed forestry activities of JFMC and VSS. These sixteen statements were measured using Likert scale (four point continuum) and from that, maximum response for each statement were selected. The result of the respondent's perception on overall performance of JFMC and VSS activities are summarized in Tables 14 to 19.

4.3.1. Performance of co-managed forestry activities as perceived by JFMC members

The responses obtained on the performance of JFMC activities on ecological aspect are listed in Table 14. The member's responses highlighted the positive changes on ecology of the area due to the implementation of JFMC. More than 50 per cent of the respondents were agreed to the statements such as "plant species diversity has changed", "success of plantation" and "increased forest stocking". The improvement in both faunal diversity and water availability were also accepted by 49.2 per cent and 45.3 per cent of members.

Table 14. The influence of JFMC activities on ecology of Eastern Attappady as perceived by JFMC members.

Sl. No.	Statements	Likert Scale				
		SA (%)	A (%)	DA (%)	SDA (%)	Maximum response
1	Plant species diversity has positively changed	20.6	65.1	14.3	0	Agree
2	Plantation had been successful in this area	23.8	57.1	11.1	8	Agree
3	Increased forest stocking	22.2	55.6	22.2	0	Agree
4	The faunal diversity of the area has improved	24.2	49.2	19	7.6	Agree
5	Water availability has improved	31.6	45.3	12.7	10.4	Agree

Note: SA- Strongly agree, A-Agree, DA-Disagree, SDA-Strongly disagree

The member's perception on changes in their socio-economic status due to JFMC activities are presented in Table 15. According to the perception of members, highest response was identified as "provided more livelihood opportunities" where it was agreed by 47.6 per cent and strongly agreed by 36.6 per cent. The second highest perception on socio-economic aspect was "allow the local people to share resources from the forests" (agreed by 46% and strongly agreed by 14.3%). But 31.7 per cent of members disagreed to this statement. The study revealed that 30.1 per cent strongly agreed and 44.4 per cent agreed to the statement "women participation increased". Eighty one percentage of participants positively responded to the statement "labour problems solved and increased household income". According to 78 per cent respondents' social evil was drastically reduced by JFMC activities in Eastern Attappady. Equal positive and negative responses were obtained for the statement "farming activities has improved".

Table 15. The influence of JFMC activities on socio-economic status of Eastern Attappady as perceived by JFMC members.

Sl. No.	Statements	Likert Scale				
		SA (%)	A (%)	DA (%)	SDA (%)	Maximum response
1	Provided more livelihood opportunities	36.6	47.6	11.1	4.7	Agree
2	Allow the local people to share resources from the forests	14.4	46	31.7	7.9	Agree
3	Women participation increased	30.1	44.4	19.2	6.3	Agree
4	Labor problems solved and increased household income	38.1	42.9	15.8	3.2	Agree
5	Drastic reduction in social evils (eg. drinking)	34	44.3	9.5	12.2	Agree
6	Farming activities has improved	10.9	38.1	34.9	16.1	Agree

Note: SA-Strongly agree, A-Agree, DA-Disagree, SDA-Strongly disagree

The positive impacts on forest management by JFMC activities measured from members' responses to the same and is presented in Table 16. The majority of members (58.7%) agreed to the statement "co-managed activity helped to understand the importance of mutual cooperation in conservation". According to the member's responses, the statements such as "AHADS arranged awareness and training programs" and "empowered to take decisions for forest activities" were agreed by 52.4 per cent and 50.8 per cent respectively. But, it is clearly visible from the study that vast majority of members (88%) were not satisfied with the statement "performance of present VSS activities good as compared to JFMC".

Table 16. The influence of JFMC activities on forest protection in Eastern Attappady as perceived by JFMC members.

Sl. No.	Statements	Likert scale				
		SA (%)	A (%)	DA (%)	SDA (%)	Maximum response
1	Helped to understand the importance of mutual cooperation in conservation	20.6	58.7	11.2	9.5	Agree
2	AHADS has arranged awareness and training programs for better forest management	38.1	52.4	9.5	0	Agree
3	Empowered to take decisions helpful to the survival of the forests	25.4	50.8	14.3	9.5	Agree
4	Forest offences have decreased	14.3	38.5	30	17.2	Agree
5	Performance of present VSS activities good as compared to JFMC	3	9	57.7	30.3	Disagree

Note: SA-Strongly agree, A-Agree, DA-Disagree, SD-Strongly disagree

4.3.2. Performance of co-managed forestry activities as perceived by VSS members

The responses obtained on the performance of VSS activities on ecological aspects are listed in Table 17. More than 50 per cent of respondents agreed to the statements such as "success of plantation activities", "increased forest stocking" and "water availability has improved". According to respondents, positive and negative responses to the statements such as "plant species diversity positively changed" and "improved faunal diversity" were observed.

Table 17. The influence of VSS activities on ecology in Eastern Attappady as perceived by VSS members.

Sl. No.	Statements	Likert scale				
		SA (%)	A (%)	DA (%)	SDA (%)	Maximum response
1	Plantation had been successful in this area	20	44.2	28.3	7.5	Agree
2	Increased forest stocking	19	40.8	28.5	11.7	Agree
3	Water availability has substantially improved	13.3	40	36.7	10	Agree
4	The cover composition (plant species diversity) has positively changed	17.5	34.2	36.7	11.7	Disagree
5	The faunal diversity of the area has improved	19.4	27.7	36.2	16.7	Disagree

Note: SA-Strongly agree, A-Agree, DA-Disagree, SDA-Strongly disagree

The members' perception on changes in socio-economic status due to the VSS activities are presented in Table 18. Equal positive and negative response observed for the statement "drastic reduction in social evils". The study showed that, 68 per cent of members positively responded to the statement "increased women participation". According to the performance of VSS, majority of members

(70%) did not perceive the statement "labour problems solved and increased household income". The members disagreed (50%) the statement "labour problem solved and increased household income". The result shows that 50 per cent of the responses were agreed and disagreed with the statement "provided more livelihood opportunities". Equal positive and negative responses were observed in the statement "allow the local people to share resources from the forests". Sixty five per cent of participants agreed to the statement "farming activities has improved".

Table 18. The influence of VSS activities on socio-economic status in Eastern Attappady as perceived by VSS members.

Sl. No.	Statements	Likert scale				
		SA (%)	A (%)	DA (%)	SDA (%)	Maximum response
1	Drastic reduction in social evils (eg: drinking etc)	23.4	35	25.8	15.8	Agree
2	Women participation increased	33.3	34.2	27.5	5	Agree
3	Labor problems solved and increased household income	6.7	23.3	50	20	Disagree
4	Allow the local people to share resources from the forests	15.8	33.3	40	10.8	Disagree
5	Provided more livelihood opportunities	13.3	37.5	41.7	7.5	Disagree
6	Farming activities has improved	20	44.5	28.3	7.5	Agree

Note: SA-Strongly agree, A-Agree, DA-Disagree, SDA-Strongly disagree

The positive impacts on forest management by VSS activities measured from members' responses to the same and is presented in Table 19. The majority of members (53.3%) agreed to the statement "Forest Department arranged awareness and training programs for better forest management".

Table 19. Influence of VSS activities on the performance of forest protection as perceived by VSS members in Eastern Attappady

Sl. No	Statements	Likert Scale				
		SA (%)	A (%)	DA (%)	SDA (%)	Maximum response
1	Forest Department has arranged awareness and training programs for better forest management	13.3	53.3	30.8	2.5	Agree
2	Forest offences have decreased	15	45.8	30	9.2	Agree
3	Helped to understand the importance of mutual cooperation in conservation	23.3	35.8	25.8	12.7	Agree
4	Performance of present VSS activities good as compared to JFMC	7.5	20	51.7	20.8	Disagree
5	Empowered to take decisions helpful to the survival of the forests	16.7	27.5	36.8	19	Disagree

Note: SA-Strongly agree, A-Agree, DA-Disagree, SDA-Strongly disagree

According to the member's responses, the statements such as "forest offences decreased" and "the importance of mutual cooperation in conservation" were agreed by 45.8 per cent and 35.8 per cent respectively. Majority of members (56%) negatively responded to the statement "empowered to take decisions for forest activities".

4.4. IMPACTS OF CO-MANAGED FORESTRY ACTIVITIES ON FOREST AND LIVELIHOOD STATUS OF STAKEHOLDERS

The study also attempted to understand the impacts on forest and livelihood status of Eastern Attappady owing to the co-managed forestry interventions like JFMC and VSS. These responses about the co-managed activities were ranked using Mann Whitney U test.

4.4.1. Impacts on forest as perceived by JFMC members and AHADS officials

The impact on forest as perceived by JFMC members is presented in Table 20. The most important impact on forest as perceived by members was "the positive changes in plant species diversity" as result of JFMC activities (mean score 125.17), which was ranked first. The respondents also subsequently ranked "success of plantation maintenance" (mean score 110.91), "faunal diversity improved" (mean score 109.68), and "increased water level" (mean score 109.26). The other impacts on forest as perceived by members are "increased forest stocking" with a mean score 107.02 (Rank V) and "reduced forest offences" with a mean score 90.48 (Rank VI).

Table 20. Impact of JFMC activities on forest as perceived by JFMC members

Sl. No.	Statements	Mean score	Rank
1	Plant species diversity has positively changed	125.17	I
2	Success of plantation	110.91	II
3	Faunal diversity improved	109.68	III
4	Water level increased	109.26	IV
5	Increased forest stocking	107.02	V
6	Forest offences reduced	90.48	VI

Majority of the officials from AHADS viewed that "plantation activities of JFMC had been successful" (Rank I). As a result of plantation activities, increased forest stocking and improved water availability were ranked second and third respectively (Table 21). In addition, the respondents said that it improved faunal diversity of the area and positively changed the plant species diversity those were

ranked fourth and fifth respectively. The officials also opinioned that forest offences did not undergo much changes due to JFMC (Rank VI).

Table 21. Impact of JFMC activities on forest as perceived by AHADS officials

Sl. No.	Statements	Mean score	Rank
1	Plantation had been successful	10.83	I
2	Increased forest stocking	10.5	II
3	Water level increased	10.5	III
4	Faunal diversity improved	10.06	IV
5	Plant species diversity has positively changed	9.94	V
6	Forest offences reduced	8.78	VI

4.4.2. Impact on livelihood status as perceived by JFMC members

The study revealed that the implementation of JFMC has changed the livelihood status of people (Table 22). The respondents said that "labour problems were solved and household income increased" (mean score 126.92) as the result of JFMC (Rank I). They also said that livelihood opportunities increased (Rank II, mean score 111.08) followed by "drastic reduction in social evils" (Rank III, mean score 107.44). Improvements in farming activities was given fourth rank and the statement "allow the people to share resources from forest" was ranked fifth. The least ranked statement was "people who out-migrated came back for jobs" (mean score 91.67).

Plate 2. Impact of co-managed forestry activities on forest ecology in Eastern Attappady

Reforested area

Regenerated River

Plate 3. Impact on socio-economic status of community in Eastern Attappady

Attappady hamlet under AHADS intervention

Community resource center at Sambarcode

Table 22. Impact of JFMC activities on livelihood as perceived by JFMC members

Sl. No.	Statements	Mean score	Rank
1	Labour problems solved and increased household income	126.92	I
2	Provided more livelihood opportunities to the local people	111.08	II
3	Drastic reduction in social evils (eg. drinking etc) among the local people	107.44	III
4	Farming activities has improved	102.71	IV
5	Allow the local people to share resources from the forests	99.69	V
6	People who out-migrated came back for jobs	91.67	VI

4.4.3. Impact on forest as perceived by VSS members and Forest Department officials

The impact on forest as result of the VSS activities as perceived by members is presented in Table 23. According to the respondents, the statement "forest offences are reduced" was ranked first (mean score 92.80). The members gave second rank to the statement "increased forest stocking" (mean score of 84.11). The result of VSS activities, "it improved water availability" (mean score 82.94) as ranked third followed by "improvement in faunal diversity" (Rank IV). The statement "plantation activities had been success" was given fifth rank (mean score 82.07). The respondents viewed that "plant species diversity did not improve" and hence ranked it in the sixth position (mean score of 74.58).

Table 23. Impact of VSS activities on forest as perceived by VSS members

Sl. No.	Statements	Mean score	Rank
1	Forest offences reduced	92.80	I
2	Increased forest stocking	84.11	II
3	Water level increased	82.94	III
4	Faunal diversity improved	82.72	IV
5	Plantation had been successful	82.07	V
6	Plant species diversity has improved	74.58	VI

Table 24. Impact of VSS activities on forest as perceived by Forest Department officials

Sl. No.	Statements	Mean score	Rank
1	Forest offences reduced	8.14	I
2	Increased forest stocking	6.64	II
3	Water level increased	6.5	III
4	Plantation had been successful	5.93	IV
5	Plant species diversity has improved	5.94	V
6	Faunal diversity improved	5.5	VI

The response of officials of Forest Department about the impact on forest are presented in Table 24. The officials viewed a "reduction in forest offences" as the major impact on forest and ranked it first (mean score 8.14). The statements

Plate 4. Hamlet of tribes in Eastern Attappady (Dhanym VSS)

Plate 5. Seedling nursery, Moolakombu VSS

"increased forest stocking" and "water level increased" due to the VSS activities were ranked second and third respectively. The other statements such as "success of plantation" (Rank IV) and "plant species diversity has improved" (Rank V) were also changed the forest status. The least rank was given to "improved faunal diversity" (mean score 5.5).

4.4.4. Impact on livelihood status as perceived by VSS members

Changes in livelihood status as a result of VSS activities is presented in Table 25. The respondents first ranked the statement "allowing the local people to share resources from the forests" as result of the involvement in VSS activities (mean score 92.17). Improvements in farming activities (mean score 87.96) and "drastic reduction in social evils" (mean score 86.38) ranked in second and third positions respectively. But, respondents gave least scores to statements like "provide more livelihood opportunities to the local people" (Rank IV, mean score 81.98) and "labour problems were solved and increased household income" (Rank V, mean score 73.67).

Table 25. Impact on livelihood status as perceived by VSS members

Sl. No.	Statements	Mean score	Rank
1	Allow the local people to share resources from the forests	92.17	I
2	Farming activities has improved	87.96	II
3	Drastic reduction in social evils (eg. drinking etc) among the local people	83.90	III
4	Provided more livelihood opportunities to the local people	81.98	IV
5	Labor problems solved and increased household income	73.67	V

4.5. LINK BETWEEN SOCIO-ECONOMIC VARIABLES AND THE VARIATION IN MEMBERS' PERCEPTIONS OF CO-MANAGED FORESTRY ACTIVITIES

4.5.1. Demographic variables and performance of JFMC activities

The link between demographic variables and members' perceptions of collective action and success of JFMC activities were analyzed by using Spearman's rank correlation coefficient method (Appendix III).

Correlation between the performance of co-managed activities and social participation as perceived by members is presented in Table 26. Social participation was observed to be significantly correlated with people perception about the benefits of protecting the green cover. Livelihood opportunities and the possibility of benefits from the forests are significantly influencing social participation. The involvement of the women also significant with social participation. The overall performance of JFMC was related with social participation.

Table 26. Link between perceptions about co-managed activities and social participation of JFMC members

Sl. No.	Statements	Correlation coefficient
1	Perceptions of protection of green cover	0.524*
2	Overall performance of JFMC	0.529*
3	More livelihood opportunities	0.327*
4	Women participation	0.268*
5	Benefits share from forests	0.355*

Note:*Significant at level of 5%

Table 27. Link between perceptions about co-managed activities and demographic variables of JFMC members

Perception statements	AGE	OCC	INC
Level of participation	0.124	0.337*	0.046
Attitude towards co-managed forestry	-0.286*	0.178	0.024
Improved farming activities	0.01	0.046	-0.336*
Out migrated people who came back for jobs	0.067	-0.126	0.340*

Note: * Significance at level of 5%, AGE- Age, OCC- Occupation, INC-Income

The performance of co-managed activities and its link with demographic variables such as age, occupation, income and education are presented in Table 27. The results indicated that age is negatively correlated to attitude towards co-managed forestry. The occupation was positively correlated to people participation in co-managed activities. The income status showed a high positive correlation with "out migrated people who came back for jobs" as result of JFMC and it also negatively affected the improvements in farming activities.

4.5.2. Link between demographic variables and performance of VSS activities

The link between demographic variables and members' perceptions of collective action and success of VSS activities were analyzed by using Spearman's rank correlation coefficient method (Appendix IV).

The link between performance of co-managed activities and social participation are presented in Table 28. Social participation had a positive correlation, which was highly significant with the perception of protection of green cover through better forest managed activities. The people attitude towards forest

and co-managed forestry were statistically significant with social participation. The social participation has been positively associated with overall performance of VSS activities and empowered to take decisions during the meetings.

Table 28. Link between perceptions about co-managed activities and social participation of VSS members

Sl. No.	Statements	Correlation coefficient
1	Perceptions of protection of green cover	0.292*
2	Overall performance of VSS	0.512*
3	Attitude towards forest	0.392*
4	Empowerment to taking decisions making by meeting	0.471*
5	Attitude towards the co-managed forestry	0.384*

Note: * Significance at level of 5%

Table 29. Link between perceptions about co-managed activities and socio-demographic variables of VSS members

Perception statements	GEN	AGE	EDN	INC
Decreased forest offences	0.049	-0.173	0.266*	0.225*
Women participation	0.166	-0.202*	0.277*	0.055
Attitude towards co-managed forestry	0.181*	-0.132	0.135	-0.101
Livelihood opportunities	0.046	0.066	-0.037	0.278*
Benefits share from forests	0.114	-0.034	0.041	0.230*
Improved farming activities	0.037	0.039	0.002	0.217*

Note: * Significance at level of 5%, GEN-Gender, AGE- Age, EDN- Education, INC-Income

The link between performance of co-managed activities and demographic variables such as gender, age, education and income are presented in Table 29. The

result shows that education and income were positively and significantly contributed to decreasing the forest offences. Women participation was negatively associated with age and also positively correlated with education. Gender was also positively related to attitude towards co-managed forestry. Co-managed forestry activities provided livelihood opportunities, benefits from the forests and improvements in farming activities which were positively correlated to income.

Linkages between co-managed forestry institutions and other institutions

Venn diagram as a tool of PRA was identified to study the link between co-managed forestry institutions and other agencies, departments etc. The data is presented in the Figures are given below. According to respondents, the relation of JFMC with AHADS was stronger and closed as compared to other institutions. This might be because AHADS was an organisation which supported JFMC, both financially and technically (Fig. 6). JFMC was overlapped with User Associations (UAs) and Ooru Vikasana Samithies (OVS). These were the people institutions of AHADS formed on watershed basis. The bank was an important component for changing livelihood status of people by involving JFMC activities. This might be because of the availability of regular employment and increase in their income which helped to develop the saving mentality of people especially among tribals. Hence, it closely associated to JFMC. The position of Self Help Groups (SHGs) were not much away from JFMC. This is might be because of AHADS had been promoted self-employment to generate income for local people through the formation of SHGs. This strategy increased the involvement and income of local people especially women and tribal people. Forest Department keep a touch with JFMC. This might be due to the forest land development activities, JFMCs improved relation with Forest Department. JFMC institutions did not give much importance to politicians, panchayat and agriculture office.

The relationship between VSS institution and other institutions are presented in the Figure 7. VSS was overlapped with forest department. VSS was

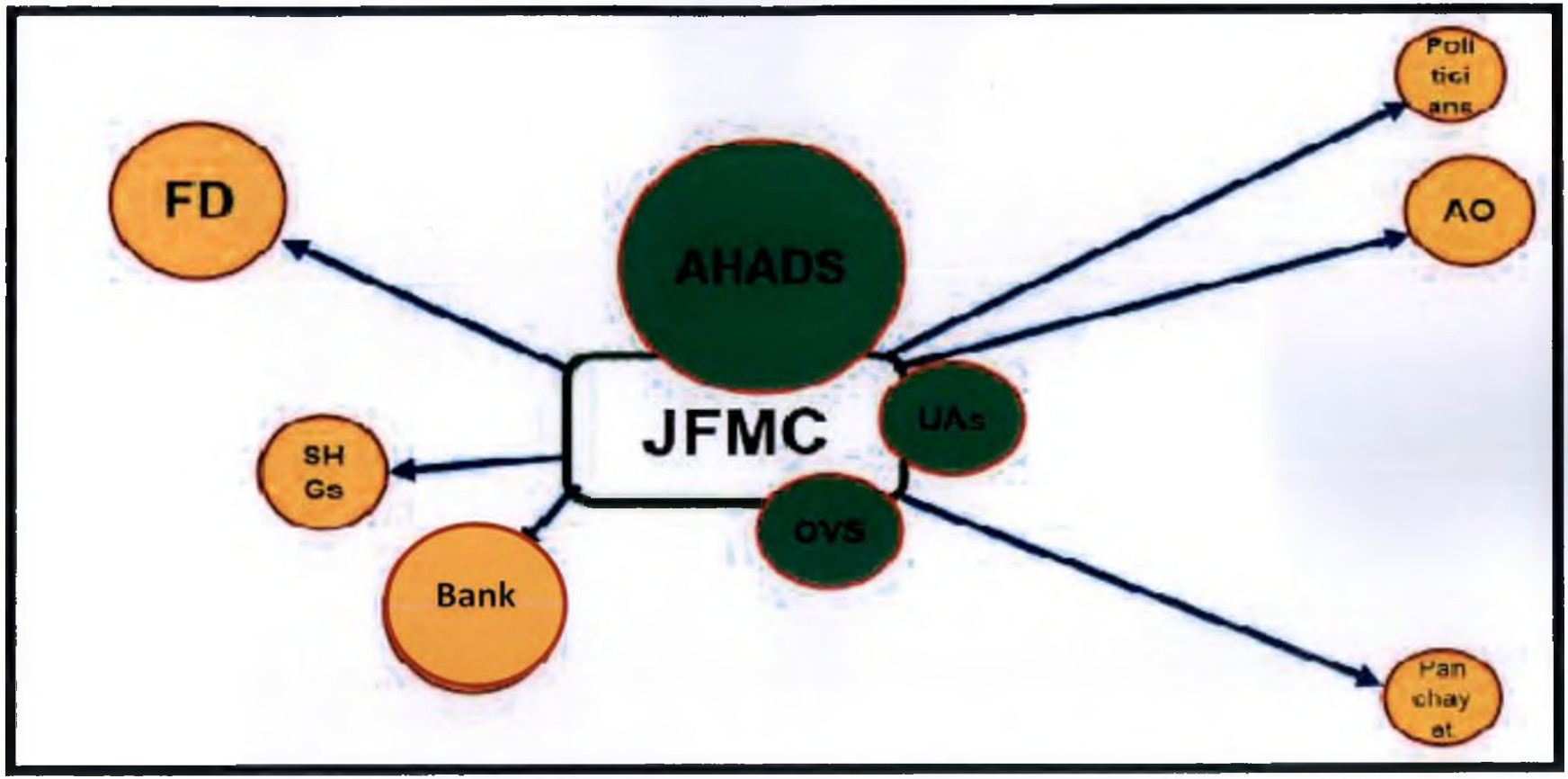


Fig.6 Linkages between JFMC and other institutions

Legend

- JFMC - Joint Forest Management
- AHADS - Attappady Hills Area Development Society
- UAs - User Associations
- OVS - Ooru Vikasana Samithies
- FD - Forest Department
- AO - Agriculture Department
- SHGs - Self Help Groups

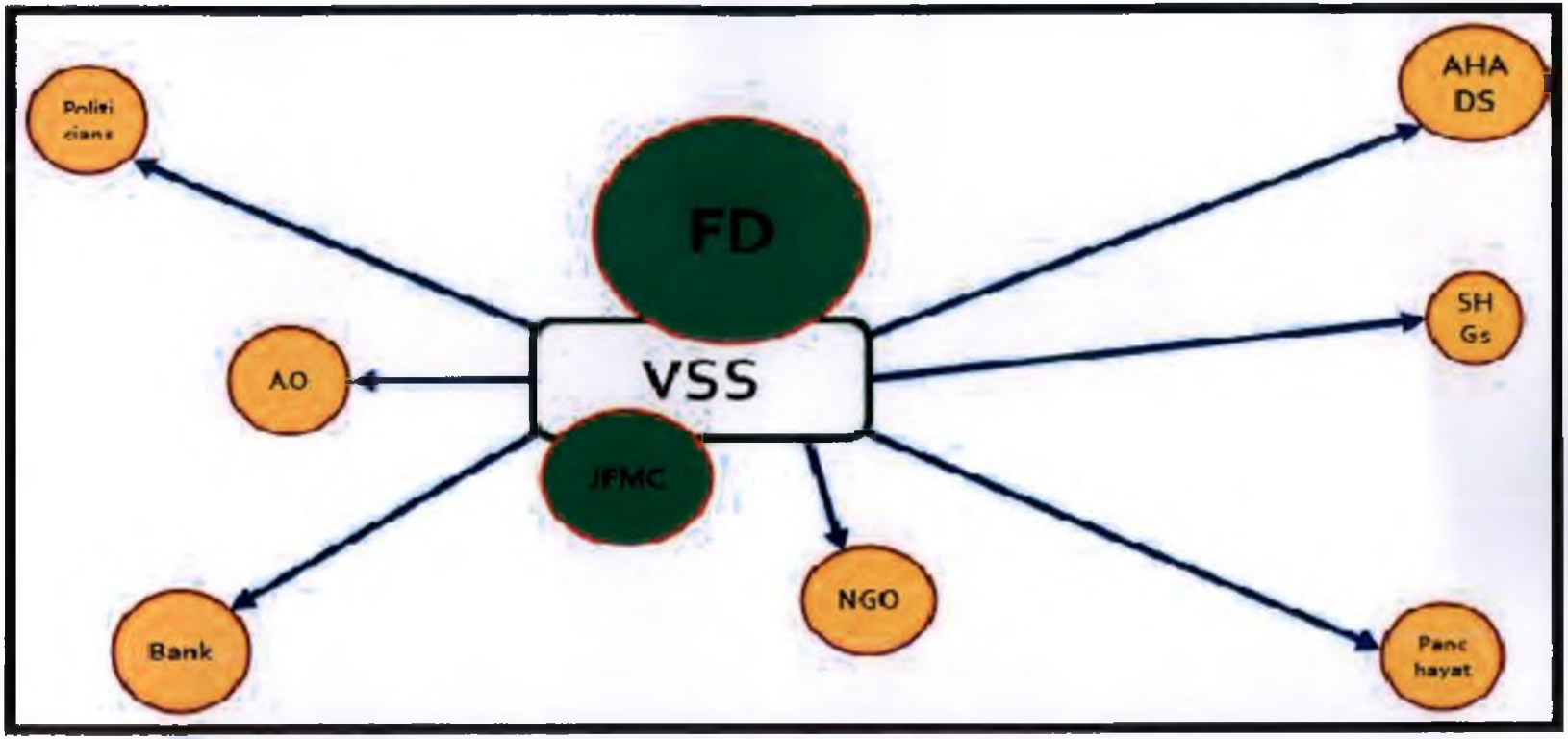


Fig. 7 Linkages between VSS and other organisations

Legend

- VSS- Vana Samrakshana Samithies
- FD- Forest Department
- AHADS- Attappady Hills Area Development Society
- NGO- Non Governmental Organisations
- AO- Agriculture Department
- SHGs- Self Help Groups

formed under Kerala Forest Department, and provide strength and support for success of activities. The VSS and JFMC were integrated to each other since AHADS completed their project. VSS also keep in touch with NGOs and agriculture office. This might be because of plantation activities and farming activities done with help of these institutions. According to respondent's perceptions, the bank kept a distance from VSS members due to the lack of regular employment and less income generation. The other agencies such as AHADS, panchyat and politicians were not much involved in VSS activities.

4.6. CONSTRAINTS AND PROBLEMS OF OPERATIONALIZING CO-MANAGED FORESTRY INSTITUTIONS

The constraints to the functioning of co-managed forestry activities identified through different Participatory Rural Appraisal (PRA) tools are described below.

4.6.1. Constraints of JFMC institutions

The constraints of JFMC institution as perceived by JFMC members and AHADS officials is presented in Table 30. The major constraint of functioning of JFMC was uncertainty about the future of the JFMC (Rank I). The JFMCs were working under an autonomous organization AHADS and its project period was completed (Rank II) which was the other problem. The members identified lack of integration with other departments and political interference which were ranked third and fourth respectively. Other constraints was lack of legal authority of JFMC and poor community cooperation.

Table 30. Problems-causes linkages of the JFMC institution

Sl. No.	Problems	Reasons	Rank (Score-10)
1	Uncertainty and ambiguity in JFMCs future	JFMC activities stopped	I (8)
2	Completion of AHADS project	AHADS is a time bound project	II (7)
3	Lack of integration with other departments	AHADS is an autonomous organisation	III (6)
4	Unnecessary political interference	Before the implementation of AHADS, all the govt. projects were implemented by the influence of politicians	IV (5)
5	Lack of legal authority	It is an organisation with limited legal provisions over the forests	IV(5)
6	Lack of group feeling among members	The diversity in social, economic, educational background can create heterogeneity and problems in team work among members	V(5)
7	Poor community cooperation at the initial stage	Lack of awareness about the objectives of JFMC at the initial stage of project	V (3)

Source: PRA exercise

4.6.2. Constraints of VSS institutions

The PRA activity foundout the constraints of VSS institution as perceived by VSS members and Forest officials is presented in Table 31.

Table 31. Problems-causes linkages of the VSS institution

Sl. No	Problems	Reasons	Rank (Score-10)
1	Lack of income generating opportunities	The VSS fund is not sufficiently mobilised for poverty alleviation	**I** (9)
2	Constant transfer of officials functioning as secretary of VSS	Every time a new official takes charge, he spend greater time to understand the VSS and its function	**II** (8)
3	People are not interested to participate in forestry works	Not get regular employment Less amount of wage as compared to outside works	**III** (7)
4	Delay of funds and timely directions from Forest Department	Delay of funds by the concerned authorities that affect members income	**IV** (6)
5	Lack of good leadership	Lack of leadership skill, low educational background	**V** (5)
6	Lack of people's participation	Most of the members are not properly aware about the objectives and aims of this program	**VI** (4)
7	Lack of cooperation between people and forest officials	Forest Department staffs are not interested take responsibility of VSS activities	**VII** (3)
8	Improper organisational structure and functioning of VSS	Lack of coordination between members and forest officials	**VIII** (2)

Source: PRA exercise

The members said that majority of peoples especially tribes, in Attappady live in below poverty line. In this situation, lack of income generating opportunities in VSS was a major constraint which was ranked first. The members also said that due to the constant transfer of forest officials functioning as secretary of VSS, did not get time to develop rapport with members (Rank II). People are not interested

in forest work (Rank III) because, they were daily wage labourers and not ready to work in VSS on a lesser wage scale. The delay in disbursement of fund for the activities ranked fourth and lack of leadership was ranked fifth. The other constraints includes lack of cooperation between people and forest officials (Rank VII) and not a proper organisation structure and functioning (Rank VIII).

4.6.3. Strength, Weakness, Opportunities and Challenges (SWOC analysis) of co-managed forestry institutions

Strengths and opportunities were considered benefits while weakness and challenges represented constraints in the SWOC analysis was done to determine the internal and external factors of JFMC and VSS that directly influence their activities. The result of this experiment is outlined in Tables 32 and 33.

4.6.3.1. *SWOC analysis of JFMC institution*

The SWOC analysis of JFMC institution is presented in the Table 32. All the identified strengths of JFMC were the reason of the success of this participatory approach. The members identified the good support the JFMC received from AHADS of the active participation of the local people as the one of the major strength. AHADS is an autonomous organisation with limited legal provisions over the forests was the major constraint, which affect smooth functioning of JFMC activities. Lack of cooperation among other departments and failure of leadership were the other problems faced by JFMC. According to the eco-restoration project, JFMC is a good mechanism to conserve soil and watersheds, a good institution for strengthening the capacity of women, poor and disadvantaged groups. The findings from SWOC analysis showed that the project was completed in 2012 as a big threat faced by JFMC for continuing the existing forest conservation works. Presently, JFMC is face the challenges of uncertainty of future activities.

Table 32. SWOC analysis of JFMC institution

STRENGTH	WEAKNESS
• Good financial, technical and resource support • Employment and income generation opportunities for local people • High level of people participation	• Lack of cooperation from other departments • Lack of good JFMC leadership which affected forest protection activities • Poor and illiterate people
OPPORTUNITIES	**CHALLENGES**
• Improved water availability-increase in farming activities • Strengthened the capacity of women, poor and disadvantaged groups • Promotion of sustainable livelihoods	• AHADS project completed • Future of JFMC unknown

Table 33. SWOC analysis of VSS institution

STRENGTH

- Support from forest department
- Link between forest department and NGOs
- The bottom-to-top approach in decision making

WEAKNESS

- Inadequacy of fund for development activities
- Lack of cooperation between staffs and local people
- Lack of people participation
- Lack of meeting and decision making

OPPORTUNITIES

- Scope for employment and income generation of poor, women and disadvantaged groups
- Changed attitude of people towards forest
- A good mechanism to conserve and protection of forests

CHALLENGES

- Inadequate organizational capacity
- Future of newly formed VSS unknown
- Financial problems
- Destruction of crops by wild animals
- Middle man intervention in NTFP collection
- Destruction of crops by wild animals

4.6.3.1. *SWOC analysis of VSS institution*

The SWOC analysis of VSS institution is presented in Table 33. The study identified that support from Forest Department and linkages with NGOs are the strength of the success of the VSS activities. The respondents also said that the bottom up approach of the co-managed activities giving freedom of choice to the forest dependent community for plantation activities and decision making in forest management and development activities. Lack of meeting and decision makings programs was the major constraint lagging the functional activities of VSS. Occupation of majority of the respondents were daily wages in Attappady. Hence, fund of VSS was not sufficient for poverty alleviation and to provide regular employment. Lack of people participation and lack of cooperation between officials and people were considered as the other major weaknesses of the institution. Moreover, they were not interested to work in VSS on lesser wages.

The result identified the opportunities such as VSS is a good mechanism to protect and management of existing forests through the involvement of local people. Scope for employment and income generation for local people is considered as the important opportunity of VSS. Challenges faced the VSS were financial problem and uncertainty future of VSS especially recently formed VSS. The respondents said that, intervention of middle man in NTFP collection was a challenge of VSS due to the lack of support from Forest Department and poor working condition of societies in Attappady.

Discussion

DISCUSSION

World over, forestry establishments had already made a paradigm shift by involving local people in the management of the public forest resources. Co-managing forests, involving the local people is also fast catching up in the heavily forested tropical regions, where most forests are a property of the state. The advantages of co-managed forestry activities includes, among others, engaging local people in managing forests thereby incorporating their ideas, experiences, values and capabilities and in turn ensuring a flow of management benefits back to the community. In community forestry, which is a co-managed scenario, it has been observed by many workers (Uphoff, 1998; Guha, 1983) that transferring rights to community level stakeholders ensures a better job than forest bureaucrats making standardised decisions in distant offices.

Attappady hills, where this study was carried out, was unique in its geography, weather, habitat and agricultural practices. Two eastward flowing rivers (Bhavani and Shiruvani) with difference in annual rainfall of 360 mm to 800mm provided uniqueness to this area. The majority of people in Attappady belonged to the indigenous (tribal) community who gained their livelihood from agriculture and through the collection and trade of non-timber forest products. The tribal population in Attappady during 1951 was 90.27 per cent. In 1961, it declined to 60.44 per cent. By 2011, the percentage of "settlers" (outsiders who came in for various jobs and who finally settled down) in Attappady touched 66 per cent. Currently, there are nearly 180 tribal hamlets in Attappady (Census of India, 2011), and mostly comprises of Muduga, Irula and Kurumba groups.

Immigration of people from adjoining districts and bordering state started in 1930s and it increased during 1940s. Most of the settlers occupied the rich, fertile valleys and converted it into agricultural lands through the introduction of unsustainable cropping systems and unharnessed grazing which resulted in massive deforestation, causing severe ecological damage and destruction. This had a ripple

effect on the livelihood opportunities of the local people (Karat, 2003). Realizing the gravity of the situation, the government and some NGOs announced and tried to implement a few developmental projects in collaboration with the Forest Department.

Some of these projects helped to restore the degraded ecology and improved the socio-economic status of Attappady. In 1966, Kundha River Valley project was introduced to conserve soil and moisture as well as to prevent siltation of the Kundha dam. Krishnavanam project as a participatory afforestation programme was introduced in Bhomiampady hamlet in 1985. The aims of this project were to motivate local people against sending their cattle for grazing, raising seedlings and planting them by involvement of women. The positive impact of this project was that the degraded forest regenerated again within ten years. The Malliswara project which started in 1993 was initiated to achieve participatory forest management with the objectives such as fire protection, seedling raising and digging of pits for soil and moisture conservation. Krishnavanam and Malliswara projects were implemented by an NGO called "Prakriti Samrakshana Samithy".

The latest environmental conservation project implemented in Atttappady was "Attappady Wasteland Comprehensive Environmental Conservation Project (AWCECOP)" under Attappady Hills Area Development Society (AHADS) in 1996. The project was implemented with the objectives of eco-restoration of wasteland and promotes sustainable livelihoods for local people through co-managed approaches. As part of this project, "Joint Forest Management committee (JFMC)" a people institution was formed for forest conservation and afforestation in the operational areas of AHADS. The time period of eco-restoration project by AHADS terminated in 2012 and thereby co-managed forestry activities of JFMC also stopped. Meanwhile, during 2002 itself, the Kerala Forest Department had also implemented "Vana Samrakshana Samithies (VSS)" under their PFM activities to protect the existing forest by involving people. After the termination of AWCECOP, all the JFMCs were subsequently integrated with VSS.

It was in this background that the present study was undertaken to analyse the performance, impacts and constraints of the two co-managed forestry activities, viz. JFMC and VSS functioning in Eastern Attappady from the perspectives of the various stakeholders.

5.1 PERFORMANCE OF CO-MANAGED FORESTRY ACTIVITIES

5. 1. 1. Performance of the JFMC institution

In the present study, more than 80 per cent of the respondents acknowledged the positive performance of the JFMC activities in terms of its ecological, socio-economic and forest protection aspects (Tables 14 to 16). The higher level of positive responses received for the statements such as "plant species diversity has positively changed", "plantation had been successful in this area" and "water availability improved" testifies JFMC's performance in the eco-restoration activities (Table 14). These positive responses in turn validates the successes of the ecological restoration activities in Attappady through the JFMCs from the perspectives of the participants. It is a known fact that AHADS, the implementer of JFMC had initiated several afforestation programmes, which, the stakeholders attested had a positive impact in the local environment of the area. It has been reported that the JFMCs had promoted many multipurpose tree species which included horticultural crops such as mango, cashew and other fruiting trees, and silvicultural species such as Neem, Silver Oak, Subabul and Casuarina (Karun *et al.*, 2005). There are also reports about streams at Eastern Attappady getting regenerated post eco-restoration attempts (Vishnudas *et al.*, 2012). The successful reforestation attempts would have definitely influenced a positive response about JFMCs.

In the socio-economic front also, the JFMC's positive influence was highlighted by the respondents (Table 15). They strongly opined that JFMC activities had contributed to their household income. They also said that JFMC

programmes also encouraged the women's participation. The respondents also acknowledged its influence on the social fabric of the society by positively responding that the co-managed activities had contributed to the reduction of many social evils. From the PRA field experiences during the course of this study, it could be gathered that prior to the commencement of the AHADS project in Attappady, local men were drawn into excessive consumption of spurious alcohol, and, in occasional cases, drug peddling too, which created community unrest and tensions within the family. At the same time, due to their social and personal inhibitions, the local women home makers, had little contacts with outsiders and society. 'Thai Kula Sangham' a women participatory group established by AHADS motivated and supported women to group up and come forward to deal and tackle their socio-economic woes. AHADS's followed this with literacy trainings and training in technical skills which further empowered women folk. These activities also positively combined to influence the social scenario and increased the women participation, which diluted the incidences of social evils among people. When the AHADS led JFMC came, the women used this opportunity to get further involved in co-managed activities that further enhanced their livelihood opportunities.

JFMC activities also positively shaped the participant's attitude about forest protection issues (Table 16). More than 50 per cent of respondents agreed that JFMC's co-managed activities helped them to understand the importance of mutual cooperation in conservation programmes. AHADS had arranged several awareness and training programs through which the members could understand and re-orient their actions and approaches about forest management practices. This might have contributed to the performance rating they gave to the JFMCs. However, this attitudinal shift could also be partially due to the awareness generated by their participation in earlier projects like Krishnavanam and Malliswara (Table 13). Moreover, the JFMC respondent's (35% high school and 27% upper primary school) higher schooling levels also could be responsible for this attitudinal shift (Table 4). Higher education naturally encourages higher levels of participation (Kusumkara, 1981 and Harbour, 1990). To add to this, majority of JFMC members

(52.4%) who participated in JFMCs were between the 36 to 50 age group. Younger age groups have increased awareness about the importance of environmental and forest conservation, hence their involvement and attitude towards forest protection activities will be better (Lubell, 2002). Our study points to the fact that middle aged and younger aged participants are more involved in the JFMC activities than the older age groups (Table 3). The high levels of participation is also due to the involvement of a younger aged and better educated participant population. .

At the same time, it is pertinent to note that the JFMC members were not appreciative of the performance of the VSS activities which were recently formed out of the JFMCs. The PRA investigations indicate that switch over from an autonomous JFMC set up into a bureaucratic VSS setup has created a lot of confusions regarding the working of the newly set up VSS. This could be a main reason for this dissatisfaction with the VSS performance. Due to the confusion surrounding this switch over, there will also be several indecisions regarding the forestry operations to be carried out. This could be another prime reason for this lack of appreciation.

5.1.2. Performance of VSS institution

The performance assessment of the VSS's activities based on ecological, social and forest protection activities (Tables 17 to 19) revealed that more than 50 per cent of the stakeholders believed that the VSS made an impressive performance in the ecological front. However, compared to the JFMC activities, the stakeholders were divided on the influence of VSS activities (Table 17) on specific areas like "improvement in cover composition" and "improvement in the faunal diversity". VSS, being attached to the forest department, its activities are more focussed on forest protection rather than on eco-restoration. This could explain why the respondents have not rated VSS activities on parity with that of JFMC activities.

On the socio-economic front, like in the case of JFMC, the VSS was acknowledged as playing a positive role to "reduce social evils" and "increase women participation". However, the respondents did not see VSS activities as probably playing an influencing role in solving the labour problems (Table 18) as JFMC. The VSS activities also is not reported as sufficiently providing employment opportunities for increasing the household income as is evident by the degree of disagreement to the statements by the respondents (Table 18). One probable reason could be due to the reported "inadequacy" or the "slow release" of funds connected with VSS activities which the participants expect as remuneration as soon as they complete their assigned activities (Table 33). The delay of fund releases by the concerned authorities not only affect the member's income, but also their opportunities for regular employment (Table 31). The respondents had opined that these kinds of administrative delays slowly dampen their enthusiasm and subsequently weakens their dependency on VSS as a livelihood opportunity.

In forest protection arena, the VSS toed the AHADS line which is evident from the kind of positive responses received for the statements like "Forest Department has arranged awareness and training programs for better forest management", "forest offences have reduced" and "VSS activities helped to understand the importance of mutual cooperation in conservation" (Table 19). As already stated, one of the main objective of VSS is the protection of forest resources. Unlike the JFMC, the VSS has very little investment in eco-restoration activities. This explains the higher acknowledgement given by the respondents to the performance of VSS in the forest protection aspects.

Through the present study, it could also be understood that the participants of both the co-managed forestry activities, viz; JFMC and VSS confirms the co-management's positive influence in the ecological restoration and forest protection activities in Eastern Attappady. However, the stakeholders viewed JFMC as a better performer in influencing the local livelihoods. It is evident from the PRA exercises that the JFMC institution encouraged their members to closely associate with the

banking activities (Fig. 6). This created opportunities for the members to understand the options for investing their earnings and also grow their income. The JFMC also had a well-structured organisational set up which ensured regular jobs and timely wage payments. Hence people got regularly employed in different programmes of JFMC such as nursery raising, plantation activities, check dam construction etc and earned higher wages. This ensured a steady livelihood opportunity and they stopped migrating for jobs in adjoining districts and bordering states (Table 27). All these helped JFMC to perform better and positively influence the livelihood of the respondents. On the other hand, by virtue of its organisational flaws and confusing priorities (Table 33), the VSS could not ensure regular employment opportunities as compared to JFMC which in turn projected it as a low income provider (Fig. 7). This explains the stark difference in the variation of perceptions regarding their performance in the livelihood and income status of people at Eastern Attappady. Co-managed programme will only succeed if it is able to ensure robust livelihood opportunities. Phiri *et al.* (2012) after analysing the community participation programme in Zambia has noted that opportunities to create monetary benefits played a crucial role in the success of this programme. The same logic holds true here for the VSS in Eastern Attappady.

5. 2. Impacts of co-managed forestry activities on forest and livelihood status of stakeholders

5.2.1. Impacts of JFMC activities

Eco-restoration of the degraded land of Eastern Attappady ecosystem was one of the main objectives of JFMCs under AHADS. Both the civilian and official respondents of JFMC clearly attested the positive impacts of the JFMC's plantation initiatives (Tables 20 and 21). By ranking the statements viz. "plant species diversity has positively changed" as first and "plantation had been successful" as second, the respondents had clearly indicated that JFMC activities had a positive impact on the local ecology. Karun *et al.* (2005) had observed that, while selecting

the species for plantations, JFMCs had given primary importance to the promotion of multipurpose tree species that fit well in the diverse agro-climatic zones of Attappady. The species used included horticultural crops such as Mango, Cashew and other fruiting trees, and silvicultural species such as Neem, Silver Oak, Subabul and Casuarina. During our investigation, the JFMC respondents had reported that the forest ecosystem had regained due to the successful implementation of JFMC's plantation activities (Table 21). Vishnudas *et al.* (2012) had reported that eco-restoration works has increased the availability of water, and that many streams and springs had regenerated. Vishnudas *et al.* (2012) had also made similar observations about the impact of eco-restoration project in Attappady. He reports a progressive change in the environment and also in the livelihood of the local people through the improvement of biophysical resource base.

However, forest protection was not a top priority area for JFMC and this could probably explain the last ranking position they gave to the statement viz. "forest offences reduced" (Table 20). The AHADS officials' view that forest offences did not change much due to JFMC also could be explained on the above basis (Table 21). Moreover, neither JFMC nor AHADS are not empowered to take legal action against forest offences. Also, as already stated, the prime focus of JFMC was the afforestation of degraded lands, and not forest protection.

The JFMC members gave top ranking to the statement "labour problems solved and increased household income", followed by "provided more livelihood opportunities to the local people" (Rank II) which attests the fact that JFMC activities positively impacted and improved the livelihood opportunities of local people (Table 22). The findings of this study is in agreement with an earlier observation by Annamalai (2006), who reported that the impact of eco-restoration project in Attappady is evident from a positively changed income, increased wages among people, especially tribals and consequent reduction in distress migration. Our study results further confirms the impact of JFMC interventions on this aspect from the perspective of the stakeholders. Moreover, as reported by Annamalai

(2006) there was also an increase in cropping areas of commercial and water intensive crops like banana and sugarcane which helped to arrest distress migrations. In this study too, the JFMC activities had a positive influence on many of these spheres as is evident from the response of the stakeholders. Moreover, the primary occupation of majority of the JFMC respondents are as daily wage basis workers (Table 4). These people were probably getting regular employment in JFMC activities which might have increased their household income and subsequently changed their lifestyles. Kamanga *et al.* (2009), Vyamana (2009) and Agrawal *et al.* (2008) acknowledges the key role forests play in supplementing household livelihoods of the forest fringe people.

5. 2. 3. Impact of VSS activities

Unlike the JFMC respondents, the VSS members and officials opined that the VSS activities made a positive impact on stopping crime and there was a drop in the number of forest offences (Tables 23 and 24). At the same time, they opined that the ecological impact of the VSS activities are minimal. The main objective of VSS was forest protection and eco-restoration activities is not a top priority item. This partially explains the low impact of VSS activities on the local ecology.

Forest has historically played as an important role as a source of income and a basis for the livelihoods of the local communities. The officials of Forest Department felt that "plantation had been successful" and "increased forest stocking" as result of VSS activities (Table 24). Hence, VSS ensured the income generating opportunities through plantation activities, fire protection, forest watching and NTFP collection. It should be noted that the main income source of the VSS respondents were from their employment as daily wage workers (70.8%) followed by farming activities (11.7%) (Table 9). Naturally, the VSS members gave top ranking to the institution's policy of "resources sharing from the forests" (Table 23). This result is in conformity with the findings by Santhoshkumar (2008), who observed that VSS in Wayanad under Kerala Forest Department obtained more

benefits from the forests than JFMC members of Attappady. The present study also observed that women were the primary collectors of forest products such as fuel, medicines and non-timber forest products. Majority of women who participated in the VSS activities belonged to the age 26-35 age group (47.1%) (Table 8). The study observed that VSS implementation brought improvements in farming activities (Table 25). Some VSS such as Moolakombu and Dhanym VSS in Eastern Attappady had established nurseries to promote vegetable farming in all VSS households.

5. 3. CONSTRAINTS AND PROBLEMS OF OPERATIONALIZING CO-MANAGED FORESTRY INSTITUTIONS

5. 3. 1. Constraints of JFMC institutions

The AHADS project period was completed in 2012 and subsequently the co-managed forestry activities of JFMC institution also came to a halt. Later, most of these JFMC institutions were integrated with VSS institution under the forest department. Sholayur and Gonjiyur JFMCs have recently got transformed to VSS under Agali Forest Range and registered under forest department. These newly formed VSS does not have a proper organizing structure and meeting schedules are yet to be finalized (Table 31). During this transition phase, the local people especially indigenous people, who were working with JFMC activities as daily wage labourers had lost their jobs. This and similar situations are because of the fact that the wounding up of the AHADS project has left the "future of the JFMC unknown" which topped the list of constraints (Table 30). The forest department general lack of extension skills coupled with their staff's personal non-preference for this off-field (VSS Secretary) job is also responsible for this slow take-off of these newly transformed VSS. Mishra *et al.* (2008) on the basis of his observations in Uttarakhand had identified lack of cooperation from forest officials, their low levels of participation and their lack of training in co-managed activities as the

major constraints in achieving success of JFM activities. These observations also hold true in Eastern Attappady.

Other constraints of these now disbanded JFMC institutions were "lack of integration with other departments" and "unnecessary political interference" (Table 30). JFMC institutions, because of their AHADS work structure never allowed much space for politicians, the local panchayat and the local Krishi Bhavan (Fig. 5), but instead used their own subject matter experts to take technical and administrative decisions. Before the AHADS project, all the developmental activities were implemented in Attappady by government departments, according to the preferences of the local politicians and government officials. However, AHADS took up the developmental projects through their own grass root organizations including JFMC, OVS etc. At the same time, AHADS, being an autonomous institution, had severe legal limitations on decision making on matters concerning forests notified as per law.

Homogeneity of a group in JFM is an important factor for its success (Agrawal, 2001). Though JFMC performed very well and provided positive impacts, the respondents admitted that the heterogeneity in the social, economic and educational background did create problems in team work resulting in a lack of group feeling. The respondents also informed that poor community cooperation at the initial stage did indeed create minor problems in the JFMC working. This might be because initially majority of the local people were less educated and lacked awareness about the scope and objective of this project and co-managed forestry activities. Our socio-economic data (Fig. 2) confirms this, 19 per cent of the members had no formal education, while 13 per cent of the respondents had only primary school education.

The present study observation is agreement with findings of Santhoshkumar (2008) who observed that the JFMC activities at Attappady decreased forest destruction, increased water level and reduced soil erosion. The JFMC interventions

also changed peoples' lifestyle because of its influence on income and farming activities. Interestingly, he also reported a lack of interest among public in the VSS activities and cited lack of opportunities for proper training, frequent transfer of the VSS secretary, lack of integration with other departments and delay in transfer of funds as the major constraints. Most of our observations on VSS in Eastern Attappady are also conform to his observations.

5. 3. 2. Constraints of VSS institutions

The study found that lack of sufficient income generating opportunities was one of the major constraints of VSS. The probable reason could be the lack of sufficient funds or administrative delays in releasing the funds earmarked for taking up VSS activities (Table 31). These administrative hitches dilutes the regular employment opportunities available in VSS. This study also identified that there is a delay in providing timely directions on various co-managed activities associated with VSS from forest department which also affected the members' income (Table 31). Masuda *et al.* (2005) after undertaking a study on JFM in Kerala had reported that delay in payments by the forest department were a factor which discouraged the members from participation. In Attapady too, it was observed that in decisions in wage payments acted as a deterrent which created a shortage of labourers to undertake VSS works. The wage structure was also low as compared to JFMC. The locals were not ready to work with lesser wages in VSS activities. The lack of awareness and clarity about the objectives and aims of VSS also led the locals away from this activity.

Sudheendra and Hirevenkanagoudar (2005) had listed the constraints of the participants of JFM in Northern Karnataka, which includes delay in implementation of activities, lack of coordination from other departments, inadequacy of the forestry extension, inadequacy of staff, and poor participation of women. Some of these are true in the case of the VSS institution in Eastern Attappady also. The constant transfer of officials functioning as secretary of VSS and lack of

cooperation between people and forest officials were observed to be defeating the purpose of the VSS (Table 31). Mishra *et al.* (2008) in his study at Kumaun in Uttarakhand had observed that forest officials did not have any rapport with villagers because of frequent transfer for one area to another area. He argued that forest officials posted in co-managed activities should be given more time to develop rapport with members. The responsibility of Secretary, VSS is an additional work with no extra perks. Naturally, the officials, barring a few, were not much interested to take up this responsibility. In the Eastern Attappady, the situation is not different either.

In this study it was further observed that most of the newly formed institutions (especially JFMC to VSS) suffered from a lack of good leadership resulting in poor organising structures and directionless actions. One of the main reason could be the refusal of the forest department staff to take up the responsibility or the department's delay in providing the leadership. These delays will wean away the men and women members of these institutions to NREGS works and will in all probability will no longer be interested to attend VSS meetings or partake in co-managed activities spearheaded by VSS (Table 31). For any JFM programme to be successful, the participants must become aware about JFM objectives, the adequacy of benefits to village communities, issues concerning the sustainability of JFM and integration of JFM and rural development (Pratima and Jattan, 2002). In the case of VSS, these issues need to be addressed so that this co-managed activity will receive a focus and direction, which will help it to revive and perform. VSS being a government initiative, it remains the primary responsibility of the forest department at Eastern Attappady to operationalize this co-managed forestry institution. But as is elsewhere, the structural and organizational weakness or lack of enthusiasm of forestry departments to adapt with co-management will remain a constraint for its operationalization (Lawrence, 2000).

CONCLUSION

The present study has acknowledged the performance of JFMC and VSS in the ecological, forest protection and livelihood fronts in Eastern Attappady. However, unlike the JFMC, the performance as well as the impact of VSS activities on the livelihoods of the local people was low. The JFMC was observed to be a far better performer than VSS from the perspectives of stakeholders on the ecological and social aspects. The VSS's performance on forest protection aspects is encouraging.

The study also found that the success of co-managed programs depends on people's socio-economic status and social participation. Socio-economic variables such as education, age, income, occupation and social participation were the important factors which positively influence people's participation.

The major constraints of JFMC were lack of integration with other departments, unnecessary political interference and lack of group feeling among members. For VSS, the major constraints were lack of income generating opportunities, lower level of people participation and constant transfer of VSS secretary. Overall, JFMC being an autonomous organization had less constraints than VSS, which was controlled by the forest department.

Based on the observations of this study, the following recommendations are being put forth.

- Learning from the JFMC experience, the structure and functions of the present VSS institution must be re-drafted to allow it to function as an independent organisation within the framework of the government policies and laws on forest.

- Financial procedures connected with VSS must be simplified so as to ensure a better participant dependency on this institution.

- Appoint only committed staff as VSS Secretary for a fixed tenure. Only those staff who has got training in leadership, soft skills and participatory skills must be appointed to this position.

- Participation of women should be increased and encouraged by providing proper representation in VSS executive committee and decision making processes.

- Providing opportunities for small incentives to the participants through the banking sector which will help to increase their participation

Summary

SUMMARY

The National Forest Policy, 1988 called for the participation of local people in the development, protection and management of forest resources. Accordingly, Government of India had issued guidelines for involving village communities and voluntary agencies in the regeneration of degraded forest lands. In Kerala, "Participatory Forest Management" (PFM) was implemented with the objective of developing appropriate participatory approaches to forest management and socio-economic contexts and to introduce and sustain it in all such areas inside as well as outside forests.

The present study was undertaken to document the performance of two co-managed forestry institutions viz; JFMC and VSS in Eastern Attappady, Kerala. The study was conducted in the Eastern Attappady, in Palakkad district of Kerala. Specific objectives of the project were to analyse the performance of the co-managed forestry activities from the perspectives of the various stakeholders, and to explore the link between socio-economic variables and variation in member's perceptions about the success of these initiatives. Another objective was to identify, find and address the various conflicts and potential suggestions for better streamlining the co-managed forestry activities. A total of 183 respondents from three Joint Forest Management Committees (JFMCs) and four Vana Samrakshana Samithies (VSS) were randomly selected from seven locations, namely Sambarcode, Paloor, Kalkandy, Puthur, Bhomiampady, Sholayur and Gonjiyur in Eastern Attappady. The members and officials of the two institutions were surveyed during the period of 2013-2014.

The salient findings are summarized below;

1. The performance of co-managed activities of JFMC and VSS were evaluated on three aspects namely ecological, socio-economic and forest protection aspects.

2. The JFMC and VSS respondents reported that both activities positively influenced the ecology of the area, increased plant species diversity, improved faunal diversity, increased water level and the plantation activities also were successful.

3. A significant contrast between the perceptions of JFMC and VSS members with regard to the livelihood of the local people were noticed. According to JFMC members, the co-managed activities increased the household income and encouraged women participation, which reduced many social evils. The VSS members on the other head opined that the performance of VSS activities was not upto the JFMC activities in improving the socio-economic status of its members.

4. The members observed that JFMC and VSS activities decreased forest offences and positively changed people attitude towards the forest.

5. Overall JFMC was observed to be a better performer than VSS on the ecological and socio-economic aspects. The study showed that people perceive more benefits from JFMC institution of AHADS than VSS of Forest department.

6. The study also observed that the success of co-managed programs depend on the socio-economic factors such as gender, age, education, income, occupation and social participation. All these factors significantly contributed to high levels of women participation and livelihood opportunities of local people.

7. Social participation also influenced the attitude of people towards the forest and co-managed activities. Income was observed to be related with livelihood opportunities which influenced the high level of people's participation.

8. The constraints of JFMC and VSS institutions were identified using Participatory Rural Appraisal (PRA) tools such as SWOC analysis and Problem causes linkages.

9. Uncertainty in JFMC's future and completion of AHADS project were the major constraints. The other constraints include lack of integration with other departments, unnecessary political interference and lack of group feeling among members.

10. Lack of income generating opportunities, lower level of people participation, constant transfer of VSS secretary and improper organisational structure and functioning were the major constraints of VSS.

11. Based on research findings, few solutions are suggested to overcome these problems which include developing a separate organizational and working situation for VSS. Providing more dependable livelihood opportunities for the stakeholders through VSS activities.

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Appendices

APPENDICES

Appendix I. Questionnaire survey form

Interview schedule for JFMC/VSS members

Independent variables (Part I)

1. Name of member :
2. Gender Male: ☐ Female: ☐
3. Age :

<25	26-35	36-50	51-65	> 66

4. Monthly income(Rs/-):

< 1,000	1,000-2,500	2,500- 5,000	5,000- 10,000	> 10,000

5. Socio- economic status
   I. Occupation:

Not gained occupation	Farming	Employee	Busines	Daily wages

   II. Land holding:
      1. Land less
      2. Small (1< ha)
      3. Medium (1.1-2 ha)
      4. Large >2 ha

   III. Education:
      1. No formal education
      2. Up to primary school
      3. Upper primary school
      4. High school
      5. Plus two
      6. College level and above

   IV. House:
      1. Shed thatched
      2. Mud walled and thatched
      3. Brick walled and tiled
      4. Concrete house

   V. Social participation:
      1. Not a member of any organization

2. Ordinary member of organization
3. Official position in Organization
4. Involvement in community work

Dependent variables (Part II)

Perception statements about the performance of co-managed forestry activities at Eastern Attappady

Sl. No	Statement	SA	A	DA	SDA
1.	I was an active participant in JFMC/VSS activities				
2.	Through JFMC/VSS activities my understanding of the benefits of protecting the local green cover improved substantially				
3.	Before JFMC/VSS implementation, the condition of forest was deforested and encroached				
4.	The green cover of the area has definitely increased through the JFMC/VSS activities				
5.	The cover composition (plant species diversity) has positively changed after the JFMC/VSS activities				
6.	The faunal diversity of the area has improved after the JFMC/VSS activities				
7.	Water availability has substantially improved after JFMC/VSS interventions				
8.	Under JFMC/VSS, plantation had been a successful in this area				
9.	Farming activities has improved after JFMC/VSS interventions				
10.	Human-wildlife conflicts have increased after the co-managed activities				
11.	As a member in JFMC/VSS, I was satisfied with the performance of JFMC/VSS activities				

12.	Performance of present VSS activities good as compared to JFMC				
13.	Co-managed activities changed my attitude towards forest after involvement in JFMC/VSS				
14.	Current budgetary allocation by Forest Department/AHADS is adequate for co-managed activities				
15.	Labor problems solved and increased household income after implementation of JFMC/VSS				
16.	JFMC/VSS activities provided more livelihood opportunities to the local people				
17.	People who once out-migrated came back for jobs in JFMC/VSS activities				
18.	There was a drastic reduction in social evils (eg. drinking etc) among the local people due to JFMC/VSS activities				
19.	JFMC/VSS has empowered me to take decisions helpful to the survival of the forests				
20.	After JFMC/VSS interventions, forest offences have decreased				
21.	The local women are more appreciative of the JFMC/VSS activities				
22.	JFMC/VSS allow the local people to share resources from the forests				
23.	Lack of expertise among members is a constraint to success of co-managed activities				
24.	JFMC/VSS activities helped us to understand the importance of mutual cooperation in conservation				
25.	Forest Department/AHADS has arranged awareness and training programs for better forest management				

SA-Strongly agree, A- Agree, DA-Disagree, SDA-Strongly Disagree

Appendix II. Profile of the sample

		VSS(N-120)		JFMC (N-63)		Total (N-183)	
		Number	Percentage	Number	Percentage	Number	Percentage
Gender	Male	67	55.8	25	39.7	92	50.3
	Female	53	44.2	38	60.3	91	49.7
Age	<25	3	2.5	5	7.9	8	4.4
	26-35	43	35.8	19	30.2	62	33.9
	36-50	60	50	33	52.4	93	50.8
	51-65	14	11.7	6	9.5	20	10.9
Monthly income	<1,000	14	11.7	4	15.9	18	9.8
	1,000-2,500	29	24.2	18	28.6	47	25.7
	2,500-5,000	60	50	31	49.2	91	49.7
	5,000-10,000	17	14.2	10	15.9	27	14.8
	>10,000	0	0	0	0	0	0
Occupation	Not gained occupation	10	8.3	5	7.9	15	8.2
	Farming	14	11.7	16	25.4	30	16.4
	Employee	10	8.3	2	3.2	12	6.6
	Business	0	0	0	0	0	0
	Daily wages	86	71.7	40	63.5	126	68.9

Land holding	Land less	7	5.8	7	11.1	14	7.7
	Small (1.1-2 ha)	31	25.8	13	20.6	44	24
	Medium (2.1-4 ha)	27	22.5	10	15.9	37	20.2
	Large > 4ha	20	16.7	12	19	32	17.5
Education	No formal education	21	17.5	12	19	33	18
	Up to primary school	20	16.7	8	12.7	28	15.3
	Upper primary school	25	20.8	17	27	42	23
	High school	46	38.3	22	34.9	68	37.2
	Plus two	6	5	4	6.3	10	5.5
	College and above	2	1.7	0	0	2	1.1
House types	Shed thatched	0	0	0	0	0	0
	Mud walled and thatched	14	11.7	18	28.6	32	17.5
	Brick walled and tiled	59	49.2	25	39.7	84	45.9
	Concrete house	47	39.2	20	31.7	67	36.6
Social participation	Not a member of any organisation	23	19.2	12	19	35	19.1
	Ordinary member of organisation	73	60.8	36	57.1	109	59.6
	Official position in organisation	24	20	15	23.8	39	21.3

Appendix III.

Perception statements about the performance of co-managed forestry activities (Dependent variables)

Sl. No.	Statements
P1	Level of participation
P2	Through JFMC activities my understanding of the benefits of protecting the local green cover improved substantially
P3	Before JFMC implementation, the condition of forest was deforested and encroached
P4	The green cover of the area has definitely increased
P5	The cover composition (plant species diversity) has positively changed
P6	The faunal diversity of the area has improved
P7	Water availability improved
P8	Plantation had been successful in this area
P9	Farming activities has improved after JFMC interventions
P10	Human-wildlife conflicts have increased
P11	Satisfied with the performance of co-managed activities
P12	Performance of present VSS activities good as compared to JFMC
P13	Changed attitude towards forest
P14	Current budgetary allocation is adequate for co-managed activities
P15	Labor problems solved and increased household income
P16	Provided more livelihood opportunities to the local people
P17	People who once out-migrated came back for jobs
P18	There was a drastic reduction in social evils (eg. drinking etc) among the local people
P19	Empowered to take decisions helpful to the survival of the forests

P20	Forest offences have decreased
P21	Women participation increased
P22	Allow the local people to share resources from the forests
P23	Lack of expertise among members is a constraint to success of co-managed activities
P24	JFMC activities helped us to understand the importance of mutual cooperation in conservation
P25	Forest Department has arranged awareness and training programs for better forest management

Correlation between demographic variables and perceptions about co-managed forestry activities of JFMC members

	Age	Income	Occupation	Education	Social participation
P1	0.124	0.046	0.337**	-0.031	0.615**
P2	-0.068	0.078	0.142	0.188	0.524**
P6	0.231	0.165	-0.037	-0.152	0.330**
P7	0.272*	0.122	0.124	-0.204	0.179
P8	0.05	0.049	-0.027	-0.061	0.098
P9	0.01	-0.336**	0.046	-0.17	-0.104
P10	-0.18	-0.265*	0.354**	0.011	-0.038
P11	-0.1	0.062	0.097	0.183	0.529**
P12	-0.199	0.008	0.104	0.131	0.099
P13	0.221	0.242	-0.106	0.034	0.137
P14	0.054	0.2	0.179	0.021	0.298*
P15	-0.037	0.068	-0.032	0.039	0.103
P16	-0.057	0.248	0.043	0.43	0.327**
P17	0.067	0.340**	-0.126	-0.046	0.03
P18	-0.222	-0.071	0.052	0.064	0.133
P19	-0.01	0.122	-0.185	0.091	0.166
P20	0.199	0.157	0.056	-0.17	0.091

P21	-0.177	-0.023	0.111	0.179	0.268*
P22	0.082	0.067	-0.087	0.114	0.355**
P24	-0.286*	0.024	0.178	0.202	0.107
P25	0.114	0.316*	-0.109	0.232	0.006

* Significance at level of 5%

Correlation between demographic variables and perceptions about co-managed forestry activities VSS of members

	Gender	Age	Income	Occupation	Education	Social participation
P1	0.053	-0.011	0.009	0.034	0.17	0.506*
P2	-0.042	-0.154	0.162	0.011	0.128	0.292*
P3	-0.246*	0.089	-0.01	-0.112	-0.04	0.183*
P4	0.027	0.055	0.159	-0.141	-0.026	0.071
P5	0.183*	0.064	0.106	-0.081	-0.014	0.288*
P6	-0.008	0.009	0.063	-0.096	0.075	0.336*
P7	0.034	0.015	0.257*	0.067	0.064	0.127
P8	0.034	-0.011	0.265*	-0.08	-0.024	0.136
P9	0.037	0.039	0.217*	-0.001	0.002	-0.024
P10	0.087	-0.065	-0.065	0.131	0.123	-0.024
P11	0.047	-0.116	-0.031	0.074	0.131	0.512*
P12	-0.079	0.073	-0.096	0.006	-0.002	0.285*
P13	0.167	-0.175	0.044	-0.002	0.145	0.392*
P14	0.077	-0.002	0.146	-0.023	0.054	0.327*
P15	-0.046	0.054	-0.045	0.117	0.073	0.234*
P16	0.046	0.066	0.278*	-0.017	-0.037	0.094
P17	-0.047	0.074	0.144	0.038	-0.074	0.094
P18	0.025	0.019	0.035	0.042	0.041	-0.018

P19	0.08	-0.088	0.097	0.009	0.168	0.471*
P20	0.049	-0.173	0.225*	-.243*	0.266*	0.17
P21	0.166	-0.202*	0.055	-0.107	0.277*	0.077
P22	0.114	-0.034	0.230*	-0.045	0.041	0.08
P23	-0.1	-0.143	0.165	-0.058	0.054	0.139
P24	0.181*	-0.132	-0.101	-0.019	0.135	0.384*
P25	0.081	0.009	0.074	-0.098	-0.042	-0.063

* Significance at level of 5%

CO-MANAGED FORESTRY AS A FUNCTION OF STAKEHOLDER PERCEPTIONS AND DEMOGRAPHIC PROFILE IN EASTERN ATTAPPADY, KERALA

by

REMYA RAGHAVAN

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ABSTRACT OF THE THESIS

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ABSTRACT

A study titled "Co-managed forestry as a function of stakeholders' perceptions and demographic profile in Eastern Attappady" was carried out during 2013-2014. The main objectives were to analyse the performance of the co-managed forestry activities from the perspectives of the various stakeholders, and to explore the link between socio-economic variables and variations in members' perceptions about the success of these initiatives. A pre-tested questionnaire was used to gather information on socio-demographic characteristics of the stakeholders', performance and impacts of co-managed activities on forest and livelihood status. A total of 183 respondents from three Joint Forest ManagementCommittees (JFMCs) and four Vana Samrakshana Samithies (VSS) drawn from seven locations, namely Sambarcode, Paloor, Kalkandy, Puthur, Bhomiampady, Sholayur, and Gonjiyur in Eastern Attappady, were surveyed. Additionally constraints of JFMC and VSS institutions were also studied using Participatory Rural Appraisal (PRA) tools such as Venn-diagram, Problem-causes linkages and SWOC analysis.

The study found that the JFMC and VSS activities positively influenced the ecology of the area. However, there was a significant contrast between the perceptions of the JFMC and the VSS members with regards to its influence on the livelihood of the local people. The JFMC members' reported that the co-managed activities, increased the household income and encouraged women participation, which reduced many social evils. Whereas, the VSS members opined that the performance of VSS activities was not upto the JFMC activities in improving the socio-economic status of its members. The JFMC was observed to be a better performer than VSS from the perspectives of stakeholders on the ecological and social aspects.

Further, the study observed that the success of co-managed programs depended on education, age, income, occupation and social participation. All these

significantly contributed to higher levels of women participation and livelihood opportunities. Social participation also influenced the attitude of people towards the forest and co-managed activities. The major constraints of JFMC, were lack of integration with other departments, unnecessary political interference and lack of group feeling among members. The major constraints for VSS were lack of income generating opportunities, lower level of people participation and constant transfer of VSS secretary.