

Reassuring livelihood functions of the forests to their dependents: Adoption of collaborative forest management system over Joint forest management regime in India

N.K. Bhatia, M. Yousuf

Bhatia N.K., Yousuf M., 2013. Reassuring livelihood functions of the forests to their dependents: Adoption of collaborative forest management system over Joint forest management regime in India. Ann. For. Res. 56(2): 377-388, 2013.

Abstract. With regard to forest management, rural livelihood, and poverty in India, it is often debated that JFM regime is not delivering livelihood functions of the forests to their dependents. This paper examines the state and scale of two decades old people-centric JFM system of India, and analyses the reasons with their indicators to shade off its shine in reducing poverty among forest dependent people in several parts of the country. Paper also discuss, how and to what extent, adoption of a multi-agency linked Collaborative Forest Management (CFM) system could be a better strategy over JFM regime to reassure delivery of livelihood functions of the forests to their dependents in rural India. Arguments in this communication are intended to provide forest managers and policy-makers with necessary input to consider some location specific forest based entrepreneurial activities in CFM mode to provide a continuous source of small income to forest dependent people to ensure long lasting success of their forest management endeavours. Paper concludes with a recommendation to convert unviable JFM areas of India into a multiagency linked CFM system in a phased manner.

Keywords Forest dependent people, poverty in India, institutional linkages, multilevel governance, tropical tasar silkworm, *Antheraea mylitta*

Authors. Narendra Kumar Bhatia (nkb11238594@gmail.com) - Regional Sericultural Research Station, Central Silk Board, Ministry of Textiles, Govt. of India, Sahaspur- 248196, Dehradun (Uttarakhand), India; Mohammad Yousuf - Head, Forest Entomology Division, Forest Research Institute, New Forest - 248006, Dehradun (Uttarakhand), India.

Manuscript received June 01, 2013; revised October 30, 2013; accepted November 22, 2013; online first November 29, 2013.

Introduction

People in forested area rely on forest to maintain their well-being (Byron & Arnold 1999) and in some cases; it serves as a source to improve their income (Ruiz-Perez et al. 2004). Forests in India support the household income of 833 million rural people (Census 2011), but for about 200 million poor people who live in 1.73 lakh fringe villages, forests are the only source for their livelihood (Nayak et al. 2012). High population density of India (382 person/km²) that is twelve times higher than the USA, reduces per capita forest availability to just 0.057 ha, that is 11 times lower than the world average of 0.64 ha. Further, India with 2.5% of the world geographical area supports 17.5% of the human population and 18% of the cattle population in the world (Census 2011, ICFRE 2012). In India, two-thirds of the total forest area is distributed in 188 tribal districts, where rural poverty is more than 50% (FSI 1997). Secondly, eighty-four percent of the India's tribal and ethnic minorities live in such areas, where natural, physical, social, and human capitals are very low (Mehta & Shah 2003). Studies have indicated that majority of forest dependent regions in India are poverty ridden (Shah & Guru 2004), and one such study suggested that fifteen out of the twenty poorest regions of India, remained in the list of poorest region, right from 1983 to 2000 (Shah 2010).

Forests have both, the potentials and limitations with regard to poverty alleviation capabilities (Angelsen & Wunder 2003). Community forestry is a crucial institutional vehicle to improve livelihood functions of the forests (Sunderlin et al. 2003). Governments around the world are decentralizing their environmental policy (Agrawal et al. 2006) to reflect the current international trend of participatory forest management (Arnold 2001, Dove 1995, Victor et al. 1998). Nearly every central government in Latin America, sub-Saharan Africa, South, and Southeast Asia claims to have decentralized the governance of forests and wild-

life (Agrawal 2004).

In India, there are two parallel economies, one that governs shining India, and other that deals with struggling India. Regarding shining India, an analysis of International Monetary Fund (IMF) shown that India overtook Japan to become third-largest economy in purchasing power parity (PPP) in 2011 after US and China (Banerji & Shah 2012). Another prediction of a US based intelligence report released in December 2012 predicted that by 2030, surging India would straddle global commerce and will dominate the world economy. Different reports caution that existing inequalities between people of rural and urban area would further widen due to infrastructural and educational deficiencies (NIC 2012). In India, there are several definitions of poverty and they are regularly tuned up to suit certain objectives of the government. Predictions indicate that some more difficult days are yet to be faced by many poor people in forested area of the country. Youth bulges are also very high, and in next 10-15 years, the country will be challenged very high to find jobs for its large youth population.

Unfortunately, the rural development strategies often neglect forests because they are mistakenly viewed as being outside the mainstream of agricultural development (UNEP 2011). High incidence of poverty in forested areas and high dependency of the poor on forests suggest a leading role for forestry in poverty eradication (FAO 2012). In present scenario, forest managers are forced to find out new ways and means to increase economic return from per unit area of the forest, to generate increased income in addition to what people are getting now from managing the forest resources in present regime of Joint Forest Management (JFM). Poverty in developing countries is the biggest problem and its alleviation is the greatest challenge for all governments. Forest-based poverty alleviation programmes specifies the use of forest resources for lessening deprivation of well-being either on temporary

or on lasting basis. Forest can help in poverty mitigation and avoidance by serving as source of subsistence, seasonal gap filters, and safety nets (Sunderlin et al. 2005).

Consequent upon some innovative experiments in society's involvement in forest management, models for participatory forest management have been evolving in India since 1980s. National forest policy, 1988 (MoEF 1988) and its subsequent resolutions emphasized the need for people's participation in protection and management of forest in India and on 1 June 1990, the concept of JFM was implemented. However, after more than two decade of its implementation in the country, it is found that JFM regime has not served the livelihood function of the forest to their dependents.

In this paper, an attempt has been made to look into the constraints of JFM regime, and how these constraints can be dissolved or at least levered-down by adoption of collaborative forest management (CFM) system. Discussion in paper is supported by the results of a successful adoption of forest based rearing of tropical tasar silkworm, *Antheraea mylitta* D. by the tribal women in Central India, which was undertaken in collaboration of multiple agencies in CFM mode.

The objective of this paper are therefore (1) to assess the state, scale, and constraints of Joint Forest Management (JFM) regime in India; (2) to evaluate the relevance of location specific multiagency-linked collaborative forest management (CFM) system in unviable JFM areas. This study is guided by a basic question that how forestry sector could be better managed and utilized to lower down the scale of poverty among poor people in forested area. Arguments in this communication are intended to provide forest managers and policy-makers with necessary input to consider location specific forest based entrepreneurial activities to convert unviable JFM areas of India into a multiagency linked CFM system.

An extensive literature survey was conducted to observe the efficacy of JFM and CFM

in livelihood delivery of the forests in terms of improved household income and its impact on poverty reduction. Main findings were considered to make an informed comparison between these two important systems of forest management in India. Results of Bhatia et al. 2011 on "improving livelihood of tribals in Chhattisgarh: Adopted rearing of tropical tasar silkworm *Antheraea mylitta* Durré" is analyzed from CFM prospective.

Increased pressure on forests is an outcome of social, economical, and industrial development coupled with demographical expansions. In forestry sector, globalization has catalyzed the process of linkages between forest communities and outside world, and effect of globalization on poor families in forested area is getting heavier than ever before. Lower earnings from JFM are not able to accommodate the requirement of forest dependent people in mounting inflations and raising cost of essential commodities. It is imperative to explore other options of forest management to address the eventualities of forest dependent people. In the following text, a comparative analysis on some of the important indicators of JFM and CFM are discussed.

Operational area under JFM is reducing in India

Ministry of Environment and Forest, Govt. of India issued guidelines in February 2000 that inter-alia included uniform nomenclature and legal backup for Joint Forest Management committees (JFMCs) along with extension of good forest area with focus on management of NTFPs. Another set of guidelines were further issued in December 2002 on setting up conflict resolution mechanism with Gram Panchayat and Panchayati Raj Institution (PRI) to ensure their support in forest management (ICFRE 2012). In India, JFM regime evolved gradually and after a slow starts with 4 M ha forest in 17 states during 1998, it now involves 22 million participants registered under 1 06 479

JFMCs in 28 states that are managing 22.02 m ha forest (Planning Commission 2011). Presently, State forest department (SFD) solely administers sixty-five percent of the total forests; while twenty-seven percent are being managed by JFMCs under the direct control of State forest Department (Thampi 2012).

Literature survey indicated that from the year 2006, there has been a downward correction in the number of registered JFMCs and their forest area under management (ICFRE 2012). It was also found that JFM as a policy prevents commercial exploitation of forest for livelihood purposes of forest dependent people and makes provisions to meet out only subsistence requirement of the local people by giving high priority to environmental security.

Functional efficacy of JFM has deteriorated in India

It is evident from the literature study that JFM is now losing its currency in India, and years after its purposive implementation it is now felt that JFM has been failed to live up to the expectation of people due to not accommodating the democratic representation of the people at various level of decision-making. According to Sarin et al. (2003), JFM is rather reducing decision-making capacity of the communities. Further, the views of local community are kept a side or often excluded in decision-making processes and failure to recognize the legitimate interests of forest dependent people; it sometimes leads to conflicts that harm the long-term goal of JFM.

Secondly, JFM fell into a trap of project-mode implementation to lure international funding and external assistance to support large JFM projects (Nayak 2002). Third, in most of the states, JFM programmes entirely depend on government funding, which raise many serious questions about its sustainability (Thampi 2012) and sometimes they are criticized for institutional corruptions by left wing extremism in India. Fourth, there

are government initiatives to provide a legal basis for JFM, but absence of a law recognizing the management rights of the communities heighten their level of insecurity (Fisher 2011). Fifth, participation of JFMCs in forest protection and management in India depends on government's call (Thampi 2012). Sixth, many forest managers believe that JFM itself is not sufficient to address the complex and multi-dimensional nature of poverty among forest communities (MoEF 2006). In spite of all these factors, JFM being people-centric major conservation efforts, it is also a principal forest management strategy in India; however, the challenge is now, how to empower JFMCs to ensure that potential benefits from forest conservation accrue to them?

Emerging need for external collaborations in forestry sector

Forests are complex both as ecosystems and diverse needs of the society. Therefore, local community's perception of problems for natural resource management and their priority is different from that of the external development agencies (Matta & Alavalapati 2006). Different stakeholders have different priorities in forest management. Therefore, to meet out diverse need of the society, we need divergent people to manage the forest. There has been some paradigm shifts in forest management; now forest preservation has changed to sustainable utilization of forest, and state controlled forest management is shifting towards collaborative forest management. In the process, collaboration has taken root in national forest planning to provide expanded opportunities for stakeholder participation (Cheng & Mattor 2006). Collaboration in natural resource management is also becoming a natural response, whenever disaffection or conflict between government agents and local people precipitates crisis (Carter & Gronow 2005).

Integrating location specific small and medium forest-based enterprises (SMFEs) into CFM

In most of the developing countries, SMFEs employ millions of the poor people and make 80-90 percent of the total enterprise numbers that creates more than 50 percent of forest-related jobs (Hobley 2008). NTFPs provide 40% of the total forest revenues and shares 55% of the total forest based employment in forested area (Prasad 2006). Many NTFPs are natural products of small and medium forest-based enterprises (SMFEs) that serve a complementary role in household economy of poorer groups within the community (Arnold & Ruiz-Perez 1998, Falconer 1990) and can be easily accommodated into CFM. The role of SMFEs becomes more critical when other incomes are low and they are more important for low-income groups than to high-income people (Jodha 1986, Hecht et al. 1988, Pimentel et al. 1997).

The benefits of SMFEs not only accrue to its producers, but intermediaries are also benefited through distinct market linkages. Neuman & Hirsch (2000) elaborated three main reasons why SMFEs can be an important economic strategy for poor people. One, it requires low capital investment; two, the tropical forests, that are the most important supplier of NTFPs are often occupied by the poorest segment of society and; three, in most cases, those forest dwellers do not have any alternate sources of income.

Sustainable SMFEs can bring positive economic, social, and environmental impacts by making significant contribution to economic development (FAO 2011), but throughout the world, SMFEs have been overlooked or poorly regulated by the governments.

SMFEs by nature are location specific, so their adoption should be based on availability of the resource, labour, and markets. These seasonal enterprises are mostly small, often household-based, and predominantly rural and

use simple technologies that require more labour but low capital investment and provide an impetus to the local economy.

SMFEs are easily accessible to low-income and socially disadvantaged groups of people, especially women and have certain micro-economic characteristics that generate a 'multiplier effect' to increase its economic benefits in rural economies by promoting domestic consumptions to improve terms of trade (Elson 2010).

Objectives and mode of functioning of JFM and CFM are different

Collaborative forest management (CFM) refers to partnership for natural resource management by involving local people as main stakeholder (Borrini-Feyerabend et al. 2004). Collaborative arrangements often incorporate the aim of improving local people's lives with their rights of access to the resource and the benefits that may accrue from management practices. According to Carter et al. (2003), recognition by the local people that forests are being degraded and their willingness to involve with forest authorities and other institutions is a prerequisite of CFM.

Creating a workable partnership between communities and key stakeholders to manage the forest is the basic concept of CFM. Ensuring sustainable use of forests resources to improve livelihood of the poor people is the goal of CFM. Increased awareness of participating agencies, adoptive planning, availability of service provider, collective conflict resolution, possibility of innovative adoption, and changed attitude of the local people and participating agencies are the essence of CFM. These classifiable modus operandi of CFM cannot be accommodated in JFM.

CFM is a dynamic approach for sustainable and equitable forest management that works in partnership with all stakeholders. Its transparent decision-making processes and judicious human and natural resource utilization ensures

diverse interests of the society. Government policy initiatives to reduce poverty in forested area can be better realized through CFM, because it accommodates institutional linkages for multi-level governance to achieve better delivery of livelihood functions of the forest to their dependents. However, JFM does not support a democratic way of work execution and depends largely on unilateral decisions of the state forest department (SFD). It is mostly the degraded forests, which are designed for the local communities in a trend of “little trees for little people” (Warner 2007) and does not provide any economic benefits to the forest communities or necessitates much effort to achieve it.

Further, the main objective of JFM is to conserve the forest; however, CFM encompasses forest conservation with creation of livelihood opportunities. Single department that is the state forest department governs JFM; however, CFM encourages workable association of different institutions to increase livelihood opportunity of forest dependent communities. JFM does not encourage participation of NGOs to manage the forest for betterment of the people; however, under CFM, effective NGOs can contribute their part in managing the forest for forest dependent people. The example of PRADAN, an NGO, in expansion of forest Seri-business in Jharkhand state of India is a shining example of workable association between different stakeholders under CFM.

Furthermore, JFM does not provide any opportunity for amalgamation of working agencies to reduce poverty in forested area; however, in CFM mode, people are sensitized themselves by seeing actual realization of money from forest related entrepreneurial activity. Regular incentives keep their moral high to contribute their highest possible energy, and drop out percentage reduces remarkably, unless there is a potential marketing threat for generated product.

Institutional linkages in CFM improves livelihood delivery of the forests

JFM system, which lacks institutional interference, does not allow any manipulation of the forest resources for betterment of the forest fringe people. However, communities are known to respond on various outside influences. There is a developing literature on managerial interactions between forest dependent people and pro-livelihood development institutions (Adger et al. 2006, Cash & Moser 2000, Lebel et al. 2005). Literature survey indicated that institutional linkages and multi-level governance systems are important for a variety of reasons. According to Sinha (2008), JFM is viewed as implementing body of forest policy by State Forest Departments and unlike *panchayats*; JFM has not accommodated the democratic representatives of the people at various levels of decision-making process.

Further, according to JFM policy, forests are not to be commercially exploited for industries; they are to be managed for conservation of soil and environment. In JFM system, people are not provided any consistent opportunity to derive any potential income from their forests. CFM on the other hand, may connect communities with several locations specific forest-based enterprises. In order to assess the impact of forest-based sericulture in livelihood improvement of the forest dependent people, and the role of this activity on forest management; Bhatia et al. (2011) conducted a study in collaboration with multiple agencies in six villages of Surguja district from 2002 to 2009, where 423 forest-dependent families were covered. The involved agencies were State Forest Department (SFD), State Department of Sericulture (DOS), and Central Silk Board (CSB), Govt. of India. Their results shown that tribal women engaged in this activity were the poorest of the poor living below to the poverty line with an annual family income of INR 11,850.00 or less. Their seven-year's success story of forest based *tasar* Seri-business from

2002-03 to 2012-13 clearly indicated that there has been an aggregate per farmer average annual income of INR 3198.00 = 00, which stands around 27% of their total annual income.

Considering the economic significance of time and energy spent by forest dependent people, this seasonal avocation of forest-based sericulture corresponded a tremendous impact in improving their livelihood earnings, especially women, to earn more and grow out of poverty and to curtail down the exploiting role of the local moneylenders (Table 1). We found that their seven-year continuous tasar silkworm rearing conserved the allotted forest area and their additional earnings helped them to improve their livelihood. In this way, different stakeholders worked together as a coherent entity for a unified goal of managing the forest for well-being of the poor people. It was a good example of linkages among government agencies to manage the forest in CFM mode.

There are other commercial insects in the forests, which can be exploited by manipulating their ecological population to improve household earning of poor people in forested area; and in different parts of the world, it is happening under CFM mode. In Sub-Saharan Africa, edible insects and their trades make significant livelihood contribution to forest dependent people (Vantomme et al. 2004). In

India, collection of bamboo borer caterpillar, *Omphisa fuscidentalis*; sago grubs, *Rhynchophorus ferrugineus*; grasshoppers, *Acrydium* spp.; dung beetles, *Heliocopris bucephalus*; forest silkworm species like *Samia cynthia*, *Antheraea proylei*, *A. assama*, forest honey-bee, *Apis dorsata*, lac insect, *Laccifer lacca* etc are many options that can safely be integrated into CFM as a livelihood component to reduce poverty. CFM discourages monocultures and prefers mixed forests, which in turn may improve terrestrial biological diversity, an important assignment for the scientists, across the forestry sector. It is evident from the results of multiple agency intervention in linking forest community with tropical tasar silkworm rearing in central India that forest-based economic initiatives at local-level commonly look for technical and institutional innovations to manage forest resources sustainably through income generating activities.

Owing to migration, population growth, and urbanization, massive demographic and land-use shifts are taking place. Therefore, making living in the fast changing world, forest dependent people would require adoptive learning and multi-agency linkages as the way to deal with uncertainty and complexity by sharing management power, governance, and responsibility (Fisher et al. 2007). In addition,

Table 1 Performance of tribal women's tasar silkworm rearing in Surguja, Chhattisgarh

Year	No of forest dependent people	Reared DFLs* (Number)	Produced Cocoons (Number)	Total amount earned (INR)	Per Farmer Income (INR)
2002-03	38	3085	200000	1,11,880.00	2,944.00
2003-04	77	7000	272755	1,63,212.00	2,120.00
2004-05	87	7750	323180	1,85,769.00	2,135.00
2005-06	31	4600	157363	73,614.00	2,375.00
2006-07	50	4200	266649	1,70,081.00	3,402.00
2007-08	70	10730	526136	3,27,964.00	4,685.00
2008-09	70	10125	499970	3,20,429.00	4,578.00
Mean	60	6784	320865	1,93,278.43	3,177.00
SD	21.00	2967.70	141901.00	97255.00	1094.50
SE	34.72	43.74	44.22	50.32	34.45

Note. *DFLs stands for disease free layings containing 200-225 eggs of tropical tasar silkworm.(Source: Bhatia et al. 2011). INR - Indian Rupees.

many governments in developing countries have prioritized CFM over traditional forest management systems (Abdus Salam et al. 2006). Collaborations can also be legally mandated, e.g. National forest management act of United State requires involvement of public in all phases of forest planning (Selin & Chavez 1995). However, given the wide variation in resource position as well as in culture and terrains of the forest areas, community involvement in forest management is necessarily location-specific, so emphasis must be on carrying forward such programmes that are locally rooted and have worked well in past (Planning Commission 2012).

Process of learning and sharing of knowledge is encouraged in CFM

CFM links scientific forest management system with traditional management, which encourages the sharing of knowledge, improves flow of information, and promotes collaborations with useful dialogue to manage the forest for betterment of the poor people. In JFM, there is no interference of scientific community between JFMCs and State forest departments, which defuses forest based livelihood innovations for forest dependent people. Results of Bhatia et al. (2011) proved that the concept of CFM could be amalgamated with JFM that begins from the formation of JFMCs at village level. These JFMCs can be connected with a multi-level governance mechanism. In their study, Bhatia et al. (2011) involved few of the JFMCs members of six villages in district Surguja as a major stake holder; State Department of Sericulture (DOS) worked as a nodal extension agency; Central Silk Board (CSB), worked as a technological facilitator and provider of silkworm seed and; State Forest Department (SFD) acted as a chief coordinating agency. This amalgamation of classifiable entities facilitated the cognitive process of multiple knowledge system; insured constant flow of information; facilitated joint problem solv-

ing; created a network for learning; achieved a workable association between scientific and traditional management system and; ensured a beneficial adaptation in a complex socio-ecological condition. All these attributes of tropical tasar silkworm rearing (TTSR) promoted an effective model of CFM to re-harmonize the tribal communities with improved earnings.

Attitude of the people is changed in CFM

Integration of different institutions with local community can better identify the hidden livelihood opportunity in different forest area and their viable linkages can increase the confidence of local people by changing their attitude towards forest management. Attitude, which means an evaluative dimension of a concept (Ajzen & Fishbein 1977), is the major antecedent of people's behaviour in relation to natural resources management (Tesfaye et al. 2012). In many studies, positive attitude of the local people correlated to their perception of benefits and costs in context of community-linked conservation efforts in Nepal (Mehta & Heinen 2001) and India (Matta & Alavalapati 2006). In JFM, it is hard to change the attitude of the forest dependent people that forests are not only important for environment reasons, but they can provide a substantial source of income to them and their generations.

Overall, CFM can provide a good governance in forestry sector

In India, forest people leaving in the forest fringes were disassociated from forest governance since 1927, owing to inaction of Forest Act 1927, which made the forest department the sole authority over almost all forests in India. Since 1970s, forest department tried to include communities in forest management. In JFM model, JFMCs are largely bound to bear with the unilateral decisions of State Forest Department; however, in CFM mode, multiple agencies, and stakeholders are involved, which

facilitates the process of unanimous decisions making. Multi-level governance system of CFM may create some problem in managing the forest, but essentially provides much opportunity to combine forest with livelihood having more space for conflict management.

On the other hand, the keenness of the forest department to preserve its own power base and not giving away its exclusive position of control over the forest to community institutions has resulted in a low level of compliance with the spirit of JFM. According to Sinha (2008), there is a complaint about forest department that they have still not given up the police image and are not sufficiently sensitized to undertake extension works and secondly, forest department unilaterally overrules the decisions of local people without explaining the reasons thereof. Third, an excessive dependence of the village communities on forest department has frustrated village autonomy and; fourth, it is observed that in JFM, often literate and younger people are chosen as leaders, who some time lack authority and legitimacy. CFM does not discriminate among functional people of the village community and encourages youth population to contribute their energy in a constructive way towards a goal oriented (livelihood creation) directional forest management activity.

Besides above; increased understanding in management of natural resources by the local people, better control over encroachment of forest land, having curb over illegal forestry activities, increased transparency in utilization of government fund, decreased corruption, and encouragement of effective forest planning for the future are some of the other indicators, which increases the probability of success of CFM in comparison to the JFM.

Few critics about efficiency of forest based enterprises (FBEs) in poverty reduction

Since 1980s, the hope for conservation of trop-

ical forests was put to forest based enterprises and NTFPs, but their livelihood delivery potential has been questioned. The sector is suffering from a host of problems such as poor returns to its gatherers, market distortions, low technology, and institutional inadequacy (Thampi 2012). Inappropriate policies have not only led to overexploitation of species in the wild, but have also reduced livelihood benefits and have generated new forms of inequality. Existing NTFPs legislation and policies is a complex and confusing mix of measures developed over a long period with poor coherence and coordination (FAO 2011). Neuman & Hirsch (2000) raised a wide range of constraints that suppress straight relationship between increased sales of non-timber forest products and corresponding increase in the income of its gatherers. They also hold an opinion that even in situations of increased prices and expanded market facilities, the economic situations of primary producers do not change, because commercial use of forest products are driven by cash demands from poor families. Further, exploitation of NTFPs rarely provides a means for the poor to actually move up to the wealthier classes and achieve their due socio-economic status. Ultimately, it appears that commercial exploitation of forest product contributes little to address the structural origins of poverty in forested area.

Further, to what extent commercialization of forest product can improve the income of its gatherers have also been questioned and the issue of sustainable supply of forest products is not easily answered. According to Dove (1993), it is likely that the largest parts of the benefits of any newly developed forest product will eventually fall in the hands of larger merchants and not in the hands of poor people in forested area, because exploitative relationships appear to be more evident in cases where intermediaries are available at point of primary production.

Conclusions

This paper examined the state, scale, and constraints of two decades old people-centric JFM system in India. It also counted the advantages of adoption of a multi-agency linked CFM system over JFM regime to reassure delivery of livelihood functions of the forests. Case study on adoption of forest-based tropical tasar sericulture activity in central India by Bhatia et al. (2011) squarely indicated that forest-based entrepreneurial activity could be undertaken through institutional linkages to reduce poverty among forest dependent people. Arguments made in this communication may provide forest managers and policy-makers with necessary input to take-up location specific forest-based entrepreneurial activities through institutional linkages. Paper recommends a phased out conversion of unviable JFM areas into a multiagency linked CFM system with location specific SMFEs as a viable livelihood component thereof.

Acknowledgements

We wish to thank to anonymous reviewers for their insightful comments they made on the draft of this article.

References

- Abdus Salam M.D., Noguchi T., Pothitan R., 2006. Community forest management in Thailand: current situation and dynamics in the context of sustainable development. *New Forests*. 31: 273–291.
- Adger W.N., Brown K., Tompkins E.L., 2006. The political economy of cross-scale networks in resource co-management. *Ecology and Society* 10(2): 9. Web: <http://www.ecologyandsociety.org/voI10/iss2/art9/>. Accessed: 10.09.2012.
- Agrawal A., 2004. Environmental politics and institutional choices: Forestry and wildlife policies in the developing world 1980-2005. Book manuscript presented at the CHAOS seminar. University of Washington Seattle June 8-9 2004.
- Agrawal A., Yadama G., Andrade R., Bhattacharya A., 2006. Decentralization and environmental conservation: Gender effects from participation in Joint Forest Management. CAPRI Working Paper No. 53. International Food Policy Research Institute Washington USA. Web: <http://www.ifpri.org/sites/default/files/publications/CAPRIWP53.pdf>. Accessed: 19.10.2012.
- Ajzen I., Fishbein M., 1977. Attitude-behaviour relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*. 845: 888–918.
- Angelsen A., Wunder S., 2003. Exploring the forest-poverty link: Key concepts issues and research implications. CIFOR Occasional Paper 40 Center for International Forestry Research Bogor Indonesia. Web: http://www.cifor.org/publications/pdf_files/OccPapers/OP-40.pdf. Accessed: 11.10. 2012.
- Arnold J.E.M., 2001. *Forest and People: 25 Years of Community Forestry*. Rome: Food and Agriculture Organization of the United Nations. Web: <http://www.fao.org/docrep/012/y2661e/y2661e01.pdf>. Accessed: 13.11.2012.
- Arnold J.E.M., Ruiz Perez M., 1998. The role of non-timber forest products in conservation and development. In: Wollenberg E., Ingles A., (eds). *Incomes from the forest: methods for the development and conservation of forest products for local communities*. Bogor Indonesia: CIFOR. p. 17-41.
- Banerji D., Shah R., 2012. India overtakes Japan to become third-largest economy in purchasing power parity. *The Economic Times*, Economy. http://articles.economictimes.indiatimes.com/2012-04-19/news/31367838_1_ppp-terms-india-s-gdp-power-parity. Accessed: 13.10.2012.
- Bhatia N.K., Bhat M.M., Khan M.A., 2011. Improving livelihood of tribals in Chhattisgarh: Adopted silkworm rearing of tropical tasar *Antheraea mylitta* Durry. *Indian Forester*. 137(2): 225-235.
- Borrini-Feyerabend G., Pimbert M., Farvar M.T., Kothari A., Renard Y., 2004. *Sharing power: Learning by doing in co-management throughout the World*. Tehran: IIED and IUCN/CEESP/CMWG Cenesta.
- Byron R.N., Arnold J.E.M., 1999. What futures for the people of the tropical forests? *World Development*. 275: 789-805.
- Carter J., Gronow J., 2005. Recent experience in collaborative forest management. CIFOR Occasional Paper 43 Center for International Forestry Research Bogor Indonesia.
- Carter J., Steenhof B., Haldimann E., Akenshaev N., 2003. Collaborative forest management in Kyrgyzstan: Moving from top-down to bottom-up decision-making. Natural Resources Group and Sustainable Agriculture and Rural Livelihoods Programme. UK: I.I.E.D. London. Web: <http://pubs.iied.org/pdfs/6360IIED.pdf>. Accessed: 21.12.2012.
- Cash D.W., Moser S.C., 2000. Linking global and local scales: designing dynamic assessment and management processes. *Global Environmental Change* 10: 109-120.
- Census, 2011. Office of the Registrar General and Census Commissioner India Ministry of Home Affairs Government of India. Web: <http://censusindia.gov.in/>.

- Cheng A., Mattor K.M., 2006. Why won't they come? Stakeholder perspectives on collaborative National Forest Planning by Participation Level. *Environmental Management*. 38: 545–561.
- Dove M.R., 1993. A revisionist view of tropical deforestation and development. *Environmental Conservation*. 20: 17–24.
- Dove M.R., 1995. The theory of social forestry intervention: the state of the art in Asia. *Agroforestry Systems* 30: 315–340.
- Elson D., 2010. Investing in locally controlled forestry: reviewing the issues from a financial investment perspective. Background paper The Forests Dialogue London United Kingdom. Web: http://environment.yale.edu/tfd/uploads/TFD_ILCF_London_Backgroundpaper_Elson.pdf. Accessed: 17.11.2012.
- Falconer J., 1990. The major significance of “minor” forest products: The local use and value of forest products in the West African humid forest zone. *Community Forestry Note No.6*. Food and Agriculture Organization of the United Nations Rome.
- FAO, 2011. State of the World's Forests 2011. Food and Agriculture Organization of the United Nations Rome. Web: <http://www.fao.org/docrep/013/i2000e/i2000e00.htm>. Accessed: 18.10.2012.
- FAO, 2012. Making forest work for the poor: Assessment of the contribution of forestry to poverty alleviation in Asia and the Pacific. FAO Regional office and Pacific Bangkok. Web: <http://www.fao.org/docrep/016/i2732e/i2732e.pdf>. Accessed: 18.10.2012.
- Fisher R., Prabhu R., McDougall C., 2007. Adaptive collaborative management of community forests in Asia: Experiences from Nepal Indonesia and the Philippines. Bogor Indonesia: Center for International Forestry Research Bogor.
- Fisher R.J., 2011. Thailand's forest regulatory framework in relation to the rights and livelihoods of forest dependent people. In: Scheyvens H., (ed). *Critical review of selected forest-related regulatory initiatives: Applying a rights perspective*. Japan: Institute for Global Environmental Strategies IGES Hayama Kanagawa.
- FSI, 1997. State of Forest Report 1997. Ministry of Environment and Forests Government of India Dehra Dun India. Web: <http://envfor.nic.in/fsi/sfr97/MAINMENU.HTML#A2>. Accessed: 18.11.2012.
- Hecht S.B., Anderson A.B., May P., 1988. The subsidy from nature: Shifting cultivation successional palm forests and rural development. *Human Organization*. 47: 25–35.
- Hobley M., 2008. Can forest reduce poverty? People forest and human well-being- managing forests for people in a period of rapid change. *Asia-Pacific Forestry Week: Social Session National Convention Center Hanoi Vietnam*. Web: <http://www.mtc.com.my/issues/images/stories/fao/plenary/tue/Booklet.pdf>. Accessed: 23.10.2012.
- ICFRE, 2012. Forest Sector Report India 2010. Dehradun India: Indian Council of Forestry Research and Education Ministry of Environment and Forest Government of India.
- Jodha N.S., 1986. Common property resources and rural poor in dry regions of India. *Economic and Political Weekly*. 2127: 1169–1181.
- Lebel L., Garden P., Imamura M., 2005. The politics of scale, position, and place in the governance of water resources in the Mekong region. *Ecology and Society* 10(2): 18. Web: <http://www.ecologyandsociety.org/vol10/iss2/art18/>. Accessed: 28.11.2012.
- Matta J.R., Alavalapati J.R.R., 2006. Perceptions of collective action and its success in community based natural resource management: An empirical analysis. *Forest Policy and Economics*. 9: 274–284.
- Mehta A.K., Shah A., 2003. Chronic poverty in India: Incidence cause and policies. In: Hulme D., Shepherd A., (eds). *Special issue on “Chronic poverty and development policy”*. *World development*. 31(3): 491–511.
- Mehta J.N., Heinen J.T., 2001. Does community-based conservation shape favourable attitudes among locals? An empirical study from Nepal. *Environmental Management*. 28: 165–177.
- MoEF, 1988. National Forest Policy 1988: Resolution No. 3-1/86-FP. New Delhi India: Ministry of Environment and Forests Government of India.
- MoEF, 2006. Measuring milestones. *Proceedings of the National Workshop on Joint Forest Management JFM*. New Delhi India: Ministry of Environment and Forests Government of India.
- Nayak B.P., Kohli P., Sharma J.V., 2012. Livelihood of local communities and forest degradation in India: Issues for REDD+. Ministry of Environment and Forests Government of India New Delhi India. Web: <http://envfor.nic.in/assets/redd-bk3.pdf>. Accessed: 18.10.2012.
- Nayak P.K., 2002. Community-based forest management in India: The issue of tenurial significance. Working Paper Foundation for Ecological Security Anand India.
- Neumann R.P., Hirsch E., 2000. Commercialization of non-timber forest products: Review and analysis of research. Bogor Indonesia: Center for International Forestry Research; Rome: FAO.
- NIC, 2012. Global Trends 2030: Alternative Worlds. National Intelligence Council (NIC), Washington, USA, p. 137.
- Pimentel D., McNair M., Buck L., Pimentel M., Kamil J., 1997. The value of forests to world food security. *Human Ecology*. 25: 91–120.
- Planning Commission, 2011. Rapid Poverty Reduction: Eleventh Five Year. New Delhi India: Planning Commission Government of India New Delhi. Web: http://planningcommission.nic.in/plans/planrel/fiveyr/11th/11_v3/11v3_ch4.pdf. Accessed: 20.10.2012.
- Planning Commission, 2012. Faster sustainable and more inclusive growth: an approach to the twelfth Five Year Plan. New Delhi India: Planning Commission Government of India New Delhi. Web: http://planningcommission.nic.in/plans/planrel/12appdrft/approach_12plan.pdf. Accessed: 19.10.2012.

- Prasad R., 2006. Strategy for sustainable forest management in India. National Status Report for ITTO Mission to India. Ministry of Environment and Forests Government of India New Delhi.
- Ruiz Perez M., Belcher B., Fu M., Yang X., 2004. Looking through the bamboo curtain: an analysis of the changing role of forest and farm income in rural livelihoods in China. *International Forestry Review* 63-4: 306-316.
- Sarin M., Singh N.M., Sunda R.N., Bhogal R.K., 2003. Devolution as a threat to democratic decision-making in forestry? Findings from three states in India. In: Edmunds D., Wollenberg E., (eds.) *Local forest management: The impacts of devolution policies*. London: Earthscan Publications. p. 22-126.
- Selin S., Chavez D., 1995. Developing a collaborative model for environmental planning and management. *Environmental Management*. 19(2): 189-195.
- Shah A., 2010. Patterns of poverty in remote rural areas: A case study of a forest-based region in Southern Orissa in India. Overseas Development Institute and the Chronic Poverty Research Centre Overseas Development Institute U.K. Web: <http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publications-opinion-files/5504.pdf>. Accessed: 9.11.2012.
- Shah A., Guru B., 2004. Poverty in remote rural areas in India: A review of evidence and issues. CPRC-IIPA Working Paper 21 Chronic Poverty Research Centre Indian Institute of Public Administration New Delhi.
- Sinha H., 2008. Integrating Multi Level Governance for Biodiversity Conservation: Biopsy of Indian Forest Management. Web: http://iasc2008.glos.ac.uk/conference%20papers/papers/S/Sinha_109801.pdf. Accessed: 17.11.2012.
- Sunderlin W.D., Angelsen A., Belcher B., Burgers P., Nasi R., Santoso L., Wunder S., 2005. Livelihoods forests and conservation in developing countries: An overview. *World Development*. 33(9): 1383-1402.
- Sunderlin W.D., Angelsen A., Wunder S., 2003. Forests and poverty alleviation. Indonesia: Centre for International Forestry Research Bogor. Web: http://www.cifor.org/publications/pdf_files/research/livelihood/Forests-poverty.pdf. Accessed: 26.10.2012.
- Tesfaye Y., Roos A., Bohlin F., 2012. Attitudes of local people towards collective action for forest management: The case of participatory forest management in Dodola area in the Bale Mountains Southern Ethiopia. *Biodiversity Conservation*. 21(1): 245-265.
- Thampi K.B., 2012. Assessment of the contribution of forestry to poverty alleviation in India. In: Konuma H., Qu Guilin Q., (eds). *Making forestry work for the people: Assessment of the contribution of forestry to poverty alleviation in Asia and the Pacific*, Bangkok: FAO. p. 99-139.
- UNEP, 2011. Sustaining forests: Investing in our common future. UNEP Policy Series Ecosystem management Issue 5 August 2011. Web: http://www.unep.org/ecosystemmanagement/Portals/7/Documents/unep_policy_series_5thUNEPPolicySeries.pdf. Accessed: 27.11.2012.
- Vantomme P., Gohler D., N'deckere-Ziangba F., 2004. Contribution of forest insects to food security and forest conservation: The example of caterpillars in Central Africa. ODI Wildlife Policy Briefing No. 3, Overseas Development Institute, London, UK.
- Victor M., Lang C., Bornemeier J., 1998. Community forestry at a crossroads: reflections and future directions in the development of community forestry. Proceedings of an International Seminar held in Bangkok Thailand 17 - 19 July 1997. RECOFFC Report No. 16. Bangkok Thailand.
- Warner K., 2007. Big trees for little people: Managing forests for poverty reduction. In: Obendorf R., Durst P.B., Mahanty S., Burslem K., Suzuki R., (eds). *A cut for the poor*. Bangkok: RAP Publication 2007/09 RECOFTC Report No. 19 FAO. p. 10-18.