

## **Joint Forest Management in India: A Potential CDM Activity**

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### **Abstract**

Recent developments have recognized afforestation and reforestation as activities, which could be undertaken under the Clean Development Mechanism (CDM) of the Kyoto Protocol. In a related development, forest management in India experienced a pivotal change in 1990 when a community-based approach, named Joint Forest Management (JFM), was adopted as one of the main strategies for protection and management of state forest lands. JFM is a forest management strategy under which the forest department and the village community enter into an agreement to jointly protect and manage forest land adjoining villages and to share responsibilities and benefits. The village community is represented through an institution specifically formed for the purpose. Currently around 64,000 Village Forest Committees are managing nearly 14 million-hectare of forestlands. With this quantitative spread of the programme there has been a paradigm shift in the perception and priorities of forest management. The importance of increasing current income levels as well as providing alternative income sources to forest communities is finally being recognized as an essential process to reducing pressure on forests. This provides an opportunity to facilitate village development activities with the help of carbon credits. The modalities of providing carbon credits to the communities are described in the paper.

### **1. Introduction**

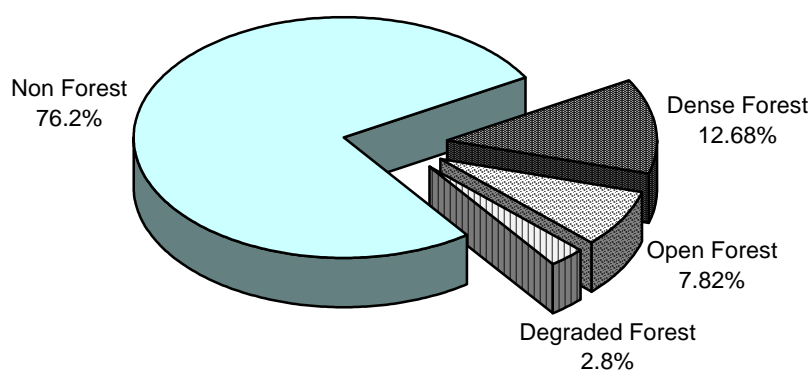
Nearly a quarter of India is classified as forestland, which is owned and managed by the government (Fig.1). Forestry is the second major land use after agriculture. A vast majority of India's population is heavily dependent on forests for meeting their basic needs of fuel wood, fodder, food, medicines, timber etc. Nearly 70% of India's population uses traditional medicine (mainly forest-based), and many of the rural poor have no access to other systems of medicine. Forests meet 40% of the energy needs of the country. Eighty percent of forest generated energy is consumed in rural areas. In addition, forests meet 30% of the country's cattle fodder requirement (NFAP, 1999).

Conservative estimates of the annual removals from the forest comprise 260 million cubic meter of fuel wood, 250 million tones of green grass and fodder, 14 million cubic metre of timber and thousands of tons of Non Timber Forest Products (NTFP), with a total value of about Indian rupees 300 billion (US \$ 7.5 billion) per year. At the micro level, forest based activities are an important source of cash income for the poor, especially during lean seasons. A study shows that forests contribute between 37% and 76% of the total income of the forest-

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fringe communities (MOEF, 2002). State-owned forests around these villages are thus vital to the subsistence needs of a large population.



**Fig. 1** Forest Cover Assessment 2001

Of the approximately 580,000 villages in India, 170,000 villages, with a total population of 147 million, are located in the vicinity of forests. The dependence of communities on these forests has had an adverse impact on their regeneration. The result has been a continuous degradation of these forests.

**Table 1** Status of forest covers in India

State of Forest Reports	Actual Forest Cover (mha)	Open Forest* (mha)	Dense Forest** (mha)
1997	63.34	26.13	37.21
1999	63.73	25.51	38.22
2001	67.55	25.87	41.68

Total Forest Area: 76.84 mha

\* Forest with crown cover between 10% and 40%

\*\*Forest with over 40% crown cover

Source: State of Forest Report 2001

While the recorded forest area (as per legal documents) is 76.84 million hectares (mha), the actual forest cover, as assessed by the Forest Survey of India, is around 67 mha (Table 1). Unfortunately, over the years more than half of India's forests have degraded bringing about both ecological crisis as well as immense suffering for the forest dependent people.

## **2. Development of Participatory Forest Management System: A Historical Account**

### **2.1. Forests under community management**

Traditional conservation and management systems that were community based had been in operation for hundreds of years before British rule began in India (Gadgil and Guha, 1992). Guha, 1989 in his book, the 'Unquiet Woods' mentions the existence of rules that prohibited the lopping of leaves in hot weather and the strict regulation of the amount of grass each family could cut. Infringement of these rules was punished by cutting off access to these forests. Co-operative agreements were worked out with neighbouring villages and the sharing of forest produce occurred amicably.

### **2.2. Forests under state management**

#### **2.2.1. The colonial era**

Most of the community based systems, however, were radically altered with the on-set of British rule, which was primarily concerned for commercial benefits and for securing large supplies of teak and other timber for the Royal Navy. The historical analysis of India's forest management patterns and policies presented in Table 2 reveals the process by which the state gradually appropriated forest resources for revenue generation under the British rule. In 1864, with the appointment of Dr Dietrich Brandis as the first Inspector General of forests, the colonial government introduced scientific forest management under a separate forest administrative system in India. Along with it, decision was also taken to convert the forests into State property through the Forest Act, to be managed by the forest service in 1865. Subsequent policies and legislations signified a liquidation of community forestry practices, thereby undermining the role and ability of village people (Singh and Varalakshmi 1998). People living along forest fringes were viewed as a hindrance to scientific forestry practices rather than a support.

#### **2.2.2. The post-independence scenario**

After independence, with the abolition of *Zamindari* (big land ownership), and application of land ceiling laws, large private forest area came to be vested in the Government and a major work of the Forest Service in the 1950s turned out to be to control, notify and bring such forests under scientific management. The Indian Forest Policy of 1952, in practice, maintained the British approach aimed to maximize the timber harvest for the state. Thus, conservation strategies crafted after independence of India continued to focus mainly on "hands off" conservation, where large areas were set aside for protection with minimal local community involvement (TERI 1999).

### **2.3. Reconciling the needs of the State and people**

In the 1970s, the Social Forestry Project (SFP), supporting the establishment of woodlots on farmlands, commons and along the side of roads and canals came as a healing balm. The SFP, that grew rapidly across the country over the 1980s was, however, based on "reaching out" rather than "working alongside" with people. The critique observed that while attention and funds in the 1980s were channeled predominantly to social forestry programmes on private

and community lands, the degradation of millions of hectares of natural state forestlands continued (Palit 1993).

Participatory governance in the forest sector assumed a new dimension in the decade of the 1970s through two other initiatives, each of a different nature. In Arabari in West Bengal, a state in India, a Divisional Forest Officer sought people's cooperation for protection of coppicing sal (*Shorea robusta*) forests when the success of a silvicultural experiment was disrupted by grazing and fuelwood pressures from the local villages. In lieu, the tribal people were given the

**Table 2** Salient feature of forest policies, legislation and programmes

Milestones	Salient features
Establishment of forest service (1864)	Initiating systematic forest management with the appointment of Dr. Dietrich Brandis as the first Inspector General of forests.
Indian Forest Act, 1865 Indian Forest Act, 1878	Declared forests as state property Forest use by villagers was not a right but a privilege of concession. Provided for the constitution of Reserved Forests and Protected Forests.
Forest Policy, 1894	Subordinated forest conservation to the promotion of agriculture. However, the policy further stated that consideration of forest income should be subordinated to the satisfaction of the needs of the local people.
Indian Forest Act 1927	Forests were categorized as Reserved, Protected, and Village forests with different degrees of privileges for the communities. The State as the sole regulator for the management and use of these forests along with forests and lands not owned by the state.
Government of India Act 1935 National Forest Policy 1952	Forests were made entirely the concern of the provinces. Monopoly rights of State over forests continued, justified in terms of national interests such as defence, industries and communications, in addition to revenue generation.
42 <sup>nd</sup> Amendment of Constitution	The subject "Forest", originally enumerated in the State list was transferred to the Concurrent list to ensure uniform policy and management of forests.
National Commission of Agriculture 1976	Recommended an aggressive programme of reforestation on denuded lands for meeting the needs of villages.
Social Forestry Programme	Attempted to reconcile industrial forestry and livelihood needs of the poor.
National Forest Policy 1988	Core emphasis on management system centered on the needs of forest communities. Envisaged involvement of people including women living along forest fringes in the development and protection of forests.

first preference for employment in the plantation areas, access to fuelwood and rotational grazing area and a share of 25% from the final harvest of sal. The response was overwhelming; the commercial value of the 1272 hectares of forest, which was nil in 1972, was estimated at Rs. 90 million in 1988 (Kumar et al. 2000).

Likewise, in Haryana, another Indian state, during the 1970s, the Sukhomajri catchment was suffering from heavy soil erosion, causing siltation of the Sukhna Lake, the primary water source in the city of Chandigarh. Vegetative and engineering structures to check the erosion in the catchment did not sustain because of non-cooperation from villagers. Subsequently, a new package of activities was designed in 1976 which included the construction of a small earthen embankment to store 0.8 ha m (hectare meters) of surplus rainwater, which sufficiently irrigated the land and tripled the crop yields. This dramatic change in livelihood provided a fillip to the people to practice social fencing. The control of grazing inside forests reduced soil erosion and regenerated forests in the catchment.

#### **2.4. The advent of Joint Forest Management (JFM)**

The seeds of participatory management of forests were thus sown through the 1970s. The first formal recognition of the same, however, came in 1988 with the enunciation of the National Forest Policy which set up as one of its main objectives meeting the basic needs of the people, essentially fuelwood, fodder and small timber (NFP, 1988). Pursuant to this, the Ministry of Environment and Forests (MoEF), Government of India, issued policy guidelines for the Joint Forest Management in 1990 for “involvement of village communities and voluntary agencies in the regeneration of degraded forests” (MoEF, 1990).

On the basis of these guidelines, the state governments issued enabling orders to provide a policy framework for the implementation of JFM programme in the states. These orders also detailed the mechanisms for benefit sharing between the communities and the government.

The JFM programme has spread across the country especially during the last decade and it is estimated that currently over 64,000 Village forest Committees, are managing around 14 million hectare of forestlands (MOEF, 2002). However, the spread of JFM is restricted mainly to a few states, which are getting funding from donor agencies such as the World Bank, JBIC etc.

#### **2.5. Institution for JFM**

JFM is a three-way partnership between the people, the Forest Department and Non-Governmental Organizations (NGOs) to protect and regenerate degraded forestlands. The forest department and the village community enter into an agreement to jointly protect and manage forest land adjoining villages and to share responsibilities and benefits. The village community is represented through an institution specifically formed for the purpose.

The key to this new system is “user group-centered controls” whereby, “as tenurial rights and delineated responsibilities become vested in the user-group, conflicts are reduced, communications improve, and local knowledge once again informs decision making.”(Poffenberger et al.1996).

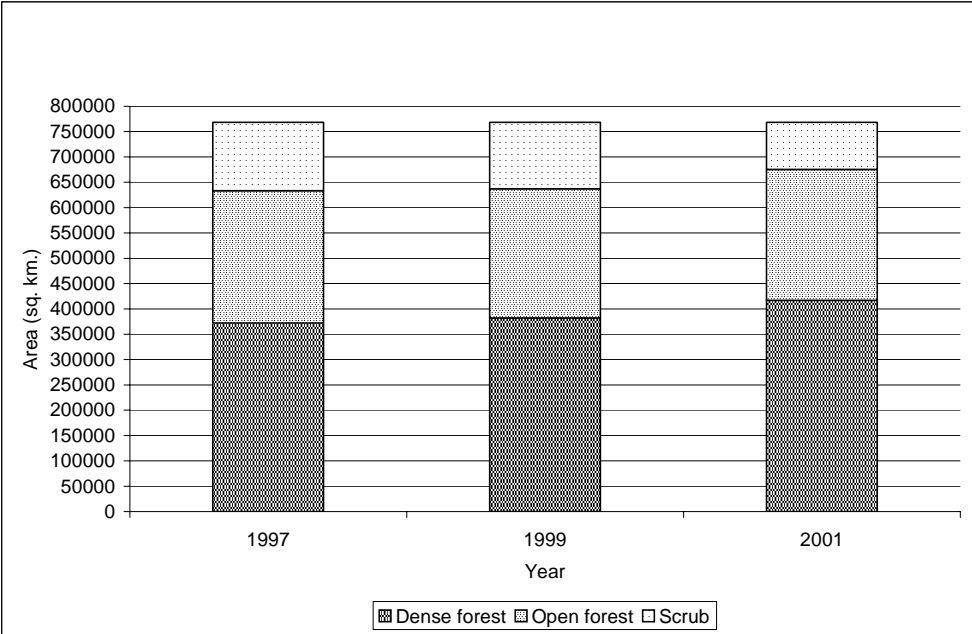
Benefits in the form of surpluses accruing from forest regeneration activities are in the form of three basic products that become available at various time intervals:

Immediate products e.g. NTFPs, grass, fuelwood etc. is available instantly or after a time period depending upon the state of degradation of the forest that is being managed jointly. Beneficiaries locally consume most of these products.

Intermediate products e.g. material produced from thinning, cultural operations etc. These are partially consumed locally and partly sold out to outside consumers.

Final product e.g. final felling products are more often than not sold out to outside consumers with only a small quantity being consumed locally by communities.

JFM in return for the villagers’ efforts to prevent forest encroachments, illicit felling, unregulated grazing, timber extraction and poaching, provides them with the benefits mentioned above. The most important aspect of these benefit-sharing arrangements is a share in the



**Fig. 2** Forest cover over the years

receipts from the sale of intermediate and final harvest. In this respect, JFM is unique and has provided people with an economic incentive for conservation, besides giving them a stake in the success of the programme.

**2.6. Impacts of JFM**

The JFM programme has led to several positive impacts. The major ones are briefly discussed here.

**2.6.1. Improvement in the condition of forests**

There is evidence that JFM has improved the condition of the country’s forests. According to Poffenberger et al. (1996), “In less than one decade, large tracts of state lands that recently existed as scrub covered wastes are now regenerating into biologically diverse, closed canopy secondary forests that produce a broad range of forest goods and ecological services.” In the past few years, satellite imagery reports provided by the Forest Survey of India (FSI) have

shown that the overall forest cover of the country has increased. In Fig.2, comparison has been made between the forest cover of the country on the basis of FSI reports of 1997, 1999 and 2001. The 1997 reports pertain to the data period 1993-1995. As stated earlier, the JFM program commenced in the year 1990 and hence, it is presumed that the changes in forest cover would only be visible in the period covered by the 1997 report.

It is believed that one main reason for this improvement is the successful implementation of the JFM program. Incidents of illicit felling have sharply declined in areas under JFM and a study carried out by the Andhra Pradesh state Forest Department indicated that between 1996 and 1999, dense and open forest covers have increased by 18 per cent and 22 per cent respectively, mainly due to the introduction of JFM (MoEF, 2002). These positive ecological effects of JFM are manifested in the increase in understorey vegetation in many places, which has led to increased biodiversity and relatively rapid increases in wild herbivore populations.

### **2.6.2. Impact on livelihood**

Forest-user communities across the country, dependent on forests for fuelwood, fodder, small timber and NTFPs, have accessed forest products under different rights regimes. During the pre-JFM period, in some States, communities have accessed forest products under rights and concessions provided under settlements. In others, communities have illicitly extracted forest produce, with or without the knowledge of the Forest Department (FD) field staff. However, under the JFM programme, residents of forest-fringe villages have been provided access to forest produce to meet their basic needs of fodder, fuelwood and NTFP. In lieu of this, people are protecting and managing the forests with the FD.

Fuelwood in the form of dry and fallen twigs and leaves from the forests are now available to participating communities. Fuelwood generated from various silvicultural operations, also supplement fuelwood supply in different states. In Andhra Pradesh and West Bengal, fuel-efficient improved stoves have also been provided to the villagers.

In pre-JFM period, people either had no grazing rights or had limited grazing rights as in Andhra Pradesh, Madhya Pradesh and Darjeeling Gorkha Hill Council areas. However, instances of uncontrolled and excessive grazing in forests were common. With JFM, there has been a ban on uncontrolled grazing. While some States like Gujarat, Haryana and Punjab have banned grazing completely, other States have allowed for rotational grazing. These practices have helped the regeneration and survival of vegetation in forests, and in increasing supply of fodder grasses. Livestock population in most areas is on the increase owing to better fodder supply, but there is a need for a well-defined national policy on grazing to sustain fodder supply from forests by supplementing it by non-forest sources and instituting change in livestock composition.

Most States did not allow any rights or share for people in forest products like NTFP, timber and other intermediary products in the past, which has, however, changed with JFM. All NTFP, barring a few nationalized products, are now available to the people free of royalty in all states. People have a right to collect even the nationalized products as Kendu leaves, Sal seeds etc. but have to deposit these with the agency responsible for their procurement and earn a prescribed wage. Apart from these, certain other provisions have been made such as in Andhra Pradesh, where 50% of net income from increased yield of Kendu leaves is equally distributed among the VFC members; in South-west Bengal people get 25% of the net profit

from cashew, etc. Income accruing to members is substantial, notwithstanding the poor infrastructure for marketing or processing of NTFPs.

VFCs are also entitled to a share in the timber harvest in varying proportions. For instance, it is 100% in Andhra Pradesh, Tamil Nadu and Bihar, 50% in Arunachal Pradesh, Orissa, Gujarat, Karnataka, Rajasthan, Tripura and Uttar Pradesh, and 20% in Nagaland. There are provisions for contribution to Village Development Fund from a portion of people's share from final harvest proceeds. However, in States where final harvesting has taken place like in West Bengal, the actual quantum of income that has accrued per family has varied from as low as Rs 50 (USD 1) to as high as Rs 13,600 (USD 270) across different sites in West Bengal (TERI 1999). At the end of 2000-2001, total community funds under JFM were USD 11.6 million in seven States (MoEF, 2002).

### **2.6.3. Reduction in encroachments**

At several places, JFM has helped reduce the area under illegal encroachment and the rate of fresh encroachments. For instance, in Andhra Pradesh, nearly 12 per cent of the encroached forestland (38,158 ha) has reportedly been vacated since the JFM programme was initiated (MoEF 2002).

### **2.6.4. Involvement of NGOs**

Involvement of NGOs in the forestry sector has increased considerably since the JFM programme was launched. Latest data from six states reveals that there are 1,061 NGOs that are actively participating in JFM (MoEF 2002).

### **2.6.5. Changing attitudes**

The ongoing JFM programme has seen a perceptible change in the attitude of forest dependent communities and the forest staff not only towards each other but also towards the forests. A large number of training and orientation programmes have been carried out in some of the states and the magnitude of the effort can be gauged from the state of Andhra Pradesh, where 20,987 JFM-related training programmes have been conducted in recent years (MoEF 2002).

### **2.6.6. Village development**

With this quantitative spread of the JFM programme there has been a paradigm shift in the perception and priorities of forest management. The importance of increasing current income levels as well as providing alternative income sources to forest communities is finally being recognized as an essential process to reducing pressure on forests. The concept of JFM in certain states has now undergone a transformation to a philosophy that embraces village development activities within its ambit. It is being recognized that while providing people with forest usufructs may be the first step in the process, ultimately, the aim is to provide alternatives to the use of these usufructs and facilitate the entire development process.

## **3. Funding for JFM**

JFM is largely being implemented in a project mode, driven by external funding. There is a large difference in the rate of spread of JFM between states that received external assistance for JFM and those which did not. As per the data available in states that received assistance such as Karnataka, Maharashtra, Madhya Pradesh, Rajasthan, Haryana, Himachal Pradesh,



Andhra Pradesh and West Bengal, nearly 48% of the open forests have been afforested under JFM. In states that did not receive assistance, only 16% of the open forests have been brought under JFM. The area afforested accounted for 17% of the total forest area in states that sought assistance, while only 7% of the total forest area were afforested in states that did not receive assistance (Ravindranath et al 2000).

It is estimated that at the current rate of its spread, an additional 10 million ha may be brought under JFM in the next 10 years (Commonwealth Forestry Association-India Chapter

**Table 3** Constitution of the FDA

S.No.	General Body	Executive Body
1	Chair persons of all Village Forest Committees	Chair person-Conservator of Forests
2	Member Secretaries of all Village Forest Committees	Member Secretary cum Chief Executive Officer-Divisional Forest Officer
3	One Designated Women Member from each Forest Committee	Ex-officio Members (without voting rights)-District Development Officer, District level Officers of Agriculture, Animal husbandry, Soil Conservation, Tribal Welfare, Industries, Panchayat Public Health & Engineering and Education Departments
4	Chair person of District Panchayat Forest Committee	Chair person of District Panchayat Forest Committee
5	Range Forest Officers, and other local staff of forest department.	Twenty-five nominees from the VFCs to include a minimum of 14 women

and Winrock International India, 2004). This rate of spread would be woefully inadequate as between 66 to 100 million ha of degraded forest and non-forest land is available for regeneration and afforestation. Inadequate financial support for JFM programmes for regeneration and afforestation and particularly for institutional and capacity building activities is thus acting as a barrier to spread and effective performance of JFM in India.

A recent study reveals that degraded forests, where community forest management has yet to be established, offer the greatest potential for future carbon sequestration and seem the best positioned to receive financing through carbon offset credit programs (Poffenberger et al, 2001).

#### 4. Forest Development Agencies

In view of the linkage of JFM with other rural development programs as well as to provide an institutional mechanism for sourcing funds, the Central government is encouraging the States to create Forest Development Agencies (FDA). It is hoped that the FDAs will provide the funnel mechanism through which assistance under various schemes would flow and be targeted to the areas covered by the FDA. FDAs are registered as Federation of Village Forest committees under the Societies Registration Act. While the FDA would constitute the administrative, supervisory and monitoring mechanism, the respective VFCs will undertake the actual implementation of the projects in the field utilizing the locally available work force.

Each FDA is headed by the respective Conservator of Forests with the respective Divisional Forest officer (DFO) as its Member-Secretary-cum-Chief Executive Officer. The other members include representatives of the VFCs These VFCs are also registered bodies. The local forest block officer/Forester is the ex-officio Member Secretary of the VFC (Table 3).

## **5. JFM and CDM**

Article 12 of Kyoto Protocol defines Clean Development Mechanism (CDM) as follows:

“The purpose of the clean development mechanism shall be to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the Convention, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.”

Recent developments have recognized afforestation and reforestation as activities which could be undertaken under CDM and this could easily include JFM activities. In all likelihood, a JFM project would qualify any sustainable development criteria, as it promotes biodiversity, improves ecology and enhances availability of various forest products to the local communities.

Under the modalities and procedures for afforestation and reforestation project activities under the clean development mechanism in the first commitment period of the Kyoto Protocol announced recently, ‘Small scale afforestation and reforestation project activities under the CDM’ are required to be implemented by low-income communities and individuals. This allows an opportunity for bringing JFM related projects under CDM, especially in those states of India which have not received any external financial support.

The critical issues that would need to be examined for determining the eligibility and feasibility of JFM as potential CDM activity would include determining additionality and baselines, defining project boundaries, permanence of carbon stocks, measurement, monitoring and verification of certified emission reductions (CERs) etc.

### **5.1. FDAs as facilitators for JFM projects under CDM**

The regenerating JFM forests would sequester carbon dioxide and the carbon credits could be accumulated by the Forest Development Agency. The FDA, in turn, would provide the necessary guarantees to the private entity interested in purchasing these credits and transfer the CERs in lieu of agreed price. The funds so received would be ploughed back into the VFCs. These funds could then be used to generate various livelihood opportunities (Fig.3). The FDA being the federation of all village forest committees in a district is thus in a unique position to represent all the village forest committees under its purview. This transfer mechanism will also involve least transaction costs to ensure viability of the project.

The VFCs are small community organizations with limited experience in dealing with other outside agencies. It would not be possible for them to negotiate with a mix of international and national organizations that would be involved in the CDM process. Similarly, it will not be practical for the private sector market mechanism to deal with VFCs that are scattered all over the country. FDAs will also be able to provide necessary guarantees to the buyers of carbon

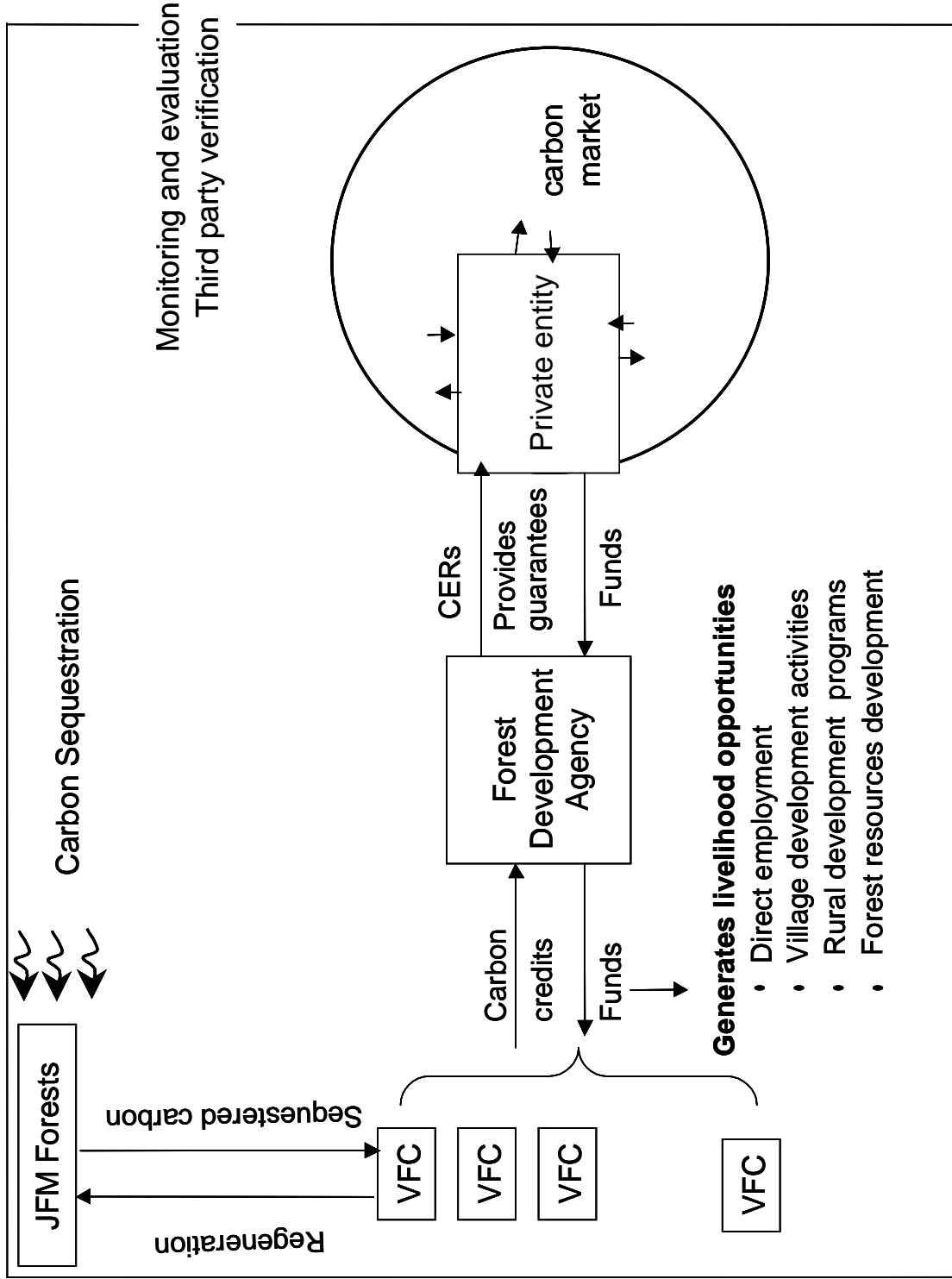


Fig. 3 Carbon credit transfer through FDA

credits. The formation of FDAs provides a unique opportunity to use them as an institutional mechanism through which carbon credit offsets can be transferred to the communities. Thus while the JFM programme is still evolving, the existing institutional mechanism of the FDAs can provide a template for CDM projects.

## 6. Conclusion

For centuries human societies have been drawing upon forest resources without ploughing back anything to maintain the health and well being of the forests. The climate change debate has set planners thinking of ways and means of financing strategies and actions which maintain environmental services, and at the same time reduce Carbon emissions. JFM projects under CDM have the potential of providing the communities with Carbon credits for regenerating degraded forest lands. These projects could attract funds for adopting innovative institutional interventions to enhance regeneration of forests and biodiversity conservation. This would not only help the local communities in obtaining benefits in the form of enhanced flow of forest products and watershed protection through enhanced vegetation cover, but would also help them in getting financial returns for every ton of carbon sequestered. In addition to providing a more stable source of forest regeneration financing, these projects could also provide the communities with means of alternative livelihood and village development activities. Forest dwellers and rural communities would thus be financially rewarded for providing global benefit in the form of enhancing the carbon sinks and for their contribution towards stabilizing Carbon dioxide concentration in the atmosphere.

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