Evolving an Effective Management Information System to Monitor Co-Management of Forests

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The failure of the Joint Forest Management programme since 2000 to sustain the growth in afforestation achieved during the 1990s is a cause for concern. This paper looks at the necessity of developing an effective management information system that can contribute meaningfully to the resilience of a JFM system. Identifying four scenarios that differ in terms of the relative contribution of the community and the State in the management process, it offers a schematic structure of an MIS.

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The rapid rate of deforestation witnessed in India during 1981-90 – at the rate of around 1.3 million hectares per year, more than 11.84 million hectares of forest cover was lost during this period (FAO 1993) – was successfully arrested during the next decade. Between 1990 and 2000, forest cover actually increased in India at an annual rate of 0.36 million hectares per year or 0.6% while the world as a whole still persisted with a "deforestation" crisis. During the same period, the global forest cover shrunk by more than 8.8 million hectares per year (0.22%) (FRA 2005; FAO 2007). However, the trend growth of afforestation in India could not be maintained during 2000-05. The Global Forest Resource Assessment (FRA) 2005 notes that between 2000 and 2005 the annual rate of increase in Indian forest cover came down to about 29,000 hectares per year, even though the figure compares well with the global scenario witnessed during the same period (–7.3 million hectares per year at an annual rate of –0.18%). The spurt in growth in forest cover during 1990-2000 also added considerably to the annual rate of growth in growing stock in Indian forests (a little less than 30 million m^3 per year) which came down to 7.2 million m^3 per year during 2000-05. These changes are to be considered against the backdrop of the fact that per capita forest cover came down drastically from 0.1 hectare in 2000 to 0.06 hectare in 2005. The growth in forest cover during 2000-05 could not simply keep pace with the growth in Indian population.

1 Background

The introduction of the new National Forest Policy (NFP) in 1988 maintained that the "principal aim of Forest Policy must be to ensure environmental stability and maintenance of ecological balance including atmospheric equilibrium which are vital for sustenance of all life forms, human, animal and plant" and made it clear in no uncertain terms that "derivation of direct economic benefit must be subordinated to this principal aim" (GOI 1988: para 2.2). This obviously played a major role in initiating reversal of trends in deforestation during 1990-2000. The introduction of "Joint Forest Management" through a union government circular dated 1 June 1990 sent to the forest secretaries of all states and union territories setting out the new policy on "involvement of village communities and VAs (village associations) in the regeneration of degraded forest lands" paved the way for the operationalisation of the policy goals (IIFM 1990). The spread of the JFM institutions was quite rapid and by 1 January 2000, 1,02,48,586.41 ha of forest land was brought under the purview of JFM with the total number of JFM forest protection committees (FPCs) managing

and protecting them standing at 36,130. In view of experiences gathered over the last decade vis-à-vis the functioning of JFM, fresh guidelines were issued to the state governments on 21 February 2000 that included issues regarding legal backup to the JFM committees, participation of women in the JFM programme, extension of JFM in good forest areas, preparation of microplan in JFM areas, conflict resolution, recognition of self-initiated groups and contribution for regeneration of resources (GOI 2002). Further guidelines, paving the way for signing of memorandum of understanding (MOU) between the FPCs and the forest department outlining the short- and long-term roles and responsibilities, implementation of work programme and pattern of sharing of usufructs and conflict resolution were issued on 24 December 2002. The resolution also underscored the necessity to create a functional relationship with the FPCs and the panchayats[1] to take advantage of the administrative and financial position and organisational capacity of the panchayats for the management of the forest resources. The guideline also emphasised that

> the success of JFM in good forest areas would depend upon the sustainable development and harvesting of Non-Timber Forest Products (NTFPs). The sustainability of JFM would also depend upon the remunerative prices for the gatherers of NTFPs. This requires a well organised setup and plan of action for the collection, transportation, storage, processing and marketing of Non-Timber Forest Products. For better return to the gatherer and the Committees, State Governments may initiate non-destructive harvesting (in accordance and within the overall prescriptions of the working plans), equity in sharing, institutional reforms and also strengthen the set-up of NTFP management based on the experience in different States. The guiding principles should be to first ensure sustainability of the resources and then maximum benefit to the gatherers and value addition. Panchayats and State Forest Corporations should assist the JFM Committees for developing skills for handling the NTFP collection, storage, marketing, etc (GoI 2002).

However, the tempo in the growth of JFM appears to have reduced even with the issuance of these two guidelines. Incidentally, the web site of the Ministry of Environment and Forests, which so painstakingly updated the data on the expansion of JFM during the second half of 1990s, has become reluctant to update them further. The latest information available on their web site pertains to 2001 and has been reproduced in Appendix 1. Information on subsequent spread of JFM activities till August 2003 could be retrieved from another web site (Kerala Planning Board 2003). Even though the source is attributed to the JFM cell of the Ministry of Environment and Forests, Government of India, it exists not on their web site but on that of the Kerala Planning Board. It is interesting to note that the number of JFM committees in India increased by 35% between 2001 and 2003 – 21,711 new committees were formed during this time – and the forest area brought under co-management increased by more than 21% during the same time, i e, more than three million hectares to be specific. However, the rate of afforestation recorded a drastic decline. And to argue further it appears that expansion of JFM has not been appropriately converted into a spurt in afforestation.

The spurt in the growth of afforestation during 1990s and its subsequent slowdown may tentatively be ascribed to the apparent loss of steam in JFM activities since the beginning of this millennium. Unfortunately, little studies have been done to link these two processes at a national level. Damodaran and Engel (2003) provides a meta-analysis of assessment of performance and evaluation of impacts of JFM in India from a social perspective using a good number of studies carried out at micro-levels all across the country. However, it did not attempt impact assessment at the ecological level to link the social processes with the status of forests.

The purpose of the paper is to pose JFM as a means to enhance the robustness of a socio-ecological system (SES) and explore the characteristics of a management information system (MIS) that may effectively help the two main stakeholders – communities and the forest department to effectively and simultaneously monitor the impact of JFM activities not only on the socio-economic characteristics of the communities involved but also on the ecological status of the forests under the management of the FPCs. The paper is divided into six sections. Section 2 poses JFM as an SES. Section 3 provides a brief outline of the concepts of SES and its resilience. Section 4 identifies the analytical difficulties in carrying out the impact assessment and evaluation of JFM in the absence of a suitable dataset. Section 5 provides an outline of a suggestive MIS, as it emerges from the literature on co-management that may help manage the forest as an SES. Section 6 identifies some possible components that may constitute the proposed MIS as suggested by the forest management practices in British India and finally Section 7 concludes.

2 JFM as a Socio-Ecological System

The paper begins with a premise that the SES in degraded forests in India almost reached a flipping point and JFM was introduced to increase SES resilience. The sudden flip of a system damages the habitat structure and destroys wild animals and several plant species which are key elements of the ecological environment in this region. This also affects the existing relationship of human society with the natural system. The later efforts to introduce JFM in better stocked forests were to ensure that they are taken care of before reaching the flipping point. The concepts of SES[2] and resilience[3] have been elaborated in the conceptual framework that follows.

Apparently, the JFM programme – introduced to strengthen SES – has not remedied several important socio-ecological challenges to improve SES resilience. It could neither make the ecological system more resilient, nor could it strengthen the social system. However, this programme sensitised locals to the necessity to create and protect forests to reorganise the SES in the interest of the social system (Chakrabarti et al 2002, 2004 and 2005). Further involvement of members of the local communities in protecting the forest and its resources, proponents of JFM felt, would add to the resilience or robustness of the SES as they issued revised guidelines to such effect in 2000 and 2002. Experiences across the country suggest that villagers are also keen to actively participate. However, such a change involves several costs. They are:

(a) Social Cost: Protection and conservation of forests will provide benefit to a section of the community/society while another section may lose out in the process. If the gain of the former is not big enough to compensate for the loss of the latter, it will be difficult to manage the assigned forest sustainably.

(b) Cost of Property Rights Transfer: The present property right regime that vests the ownership of the forest land in the state may not be effective in ensuring sustainable management of the forest patch in question.

(c) Research Cost: A JFM system may not be effective unless and until the existing behaviour of the flora and fauna found inside a forest patch is known for certain and such knowledge is incorporated while laying out "rules of use" for managing the forest. Such knowledge base is scanty necessitating a considerable research cost to develop the relevant database. Further, effective management of the forest, once established, will also be dependent on creation of a knowledge base that enlarges through continuous recording of the feedback mechanism that operates within the SES. Such a research cost will also have to be budgeted.

These three types of costs, taken together, constitute what we may term as the start-up costs. In this paper, no attempt has been

Table 1: Attributes Influencing Resilience of a Social-Ecological System

Resource System	Group	Institution	External Environment	
R1 Size	G1 Size	I1 Rules simple and easy to understand	E1 Technology	
R2 Boundary	G2 Boundary	I2 Locally devised access and management rules		E1a Low-cost exclusion technology
R3 Mobility	G3 Shared norms	I3 Ease in enforcement of rules		E1b Time for adaptation to new technologies to manage commons
R4 Storage of benefits	G4 Memory	I4 Graduated sanctions		
R5 Predictability	G5 Leadership	I5 Low cost conflict resolution	E2 Low levels of articulation with external markets	
	G6 Interdependence within group	I6 Accountability of monitors to users	E3 Gradual change in articulation with external markets	
	G7 Heterogeneity in endowment/ homogeneity of interests		E4 State	
				E4a Should not undermine local authority
	G8 Incidence of poverty			E4b Supportive external sanctioning institutions
				E4c Aid to compensate local users
				E4d Nested levels of appropriation, provision, enforcement, governance

Resource-Group Interaction	Resource-Institution Interaction
RG1 Locational overlap	RI1 Resource harvest rules matched to regeneration capacity of resource
RG2 High level of dependence on resource	
RG3 Fairness in allocation of resources	
RG4 Low level of user demand	
RG5 Gradual change in user demand	

Source: Agrawal (2002): 62-63.

made to take care of all the components of start-up costs. We only attempt to provide a broad structure of an effective MIS to be jointly used by the community and the forest department as a decision-making tool that may help minimise the research cost in co-managing a patch of forest.

3 Conceptual Framework

The concern for protection and conservation of forests is perhaps more influenced by the selfish interest of mankind to survive than out of sheer love for non-human living species. Researchers are convinced that social variables that influence the quality of human lives are intimately linked to a host of biophysical variables – biodiversity and global warming being the prominent ones (Stern et al 2006). Interactions between biophysical and social variables produce what is known as a SES (Hadjibiros et al 2005: 392; Janssen et al 2007: 309; Vincent 2007: 12). The stability of the socio-ecological system is at the centre of the issue of protection and conservation of forests.

The loss of biological connectivity today (Metcalfe 2005: 3; Natural Resource Committee 2006: 1) potentially undermines long-term environmental security of human residents and, therefore, poses a threat to the sustainability of the existing SES (GMS 2005: 2). The key task for the world community, according to one school of thought, is to maintain contiguous natural habitats and sustain ecological diversity (Daming and Wenjuan 2004; Johns 2000) around the world. A larger habitat increases the survival viability of flora and fauna, particularly for the endemic species (MNS Position Statement 2005: 1). This role is related to the diversity of functional groups of species in a system, like organisms that pollinate, graze, predate, fix nitrogen, spread seeds, decompose, generate soils, modify water flows, open up patches for reorganisation and contribute to the colonisation of such patches (Folke et al 2002: 25; Rocha and Redaelli 2004: 310). However, biodiversity often tends to be undervalued from an economic, if not always from a socio-politico-economic perspective (GMS 2005: 3). Recent attempts that argued in favour of increased economic value of biodiversity include Stern et al (2006); Kanchan Chopra Committee (2006); Datta et al (2006); Gundimeda et al (undated). A proper valuation of biodiversity necessarily requires thorough understanding of the functioning and the sources of vulnerability to an SES (Daming and Wenjuam 2004). The issue of the resilience of an SES becomes key to such valuations.

Resilience as a concept emerged from the ecologists' notebook. To consider one among a plethora of definitions available in the literature, it is the amount of disturbance that a system can absorb before it changes state (Brand and Jax 2007; Gunderson et al 2002: 1). The resilience of an ecological system is indicated by (a) the amount of disturbance a system can absorb and still remain within the same state or domain of attraction; (b) the degree to which the system is capable of self-organisation;[4] (c) the degree to which the system can build and increase the capacity for learning and adaptation (Carpenter et al 2001a, cited in Folke et al 2002: 13).

Hence, the loss of resilience can lead a system to vulnerability and consequent switch to an alternative state (Folke et al 2002: 28).

As we attempt to extend the scope of the concept of resilience to a socio-ecological system, we may term it to be the capacity of the social and ecological systems operating in an integrated manner to absorb disturbances, to self-organise and to build on and increase the capacity for learning and adaptation. From an operational perspective we may consider it to be the capacity of the social system to take up adaptive co-management of the ecological system that not only adds separately to the resilience of both the social and ecological systems, but also in combination adds further to the resilience of both these systems considered individually. To elaborate, being interlinked to one another, each of the social and ecological systems is capable of introducing disturbances into the other. And each of these systems has its own capacity to absorb such disturbances, self-organise and learn from the past and adapt. The capacities of the respective systems need not necessarily be identical. The resilience of the integrated social-ecological system derives its enhanced capacity as the capacity of an individual system reinforces that of the other while operating in tandem.

4 Analytical Difficulties in Assessing Resilience of an SES

It is indeed challenging to observe that scholars have indentified quite a large number of factors that may individually or in combination with others contribute to or reduce the resilience of an SES. Agrawal (2002) synthesises the available literature and comes up with a list of such factors divided across four distinct but interdependent groups. They are: (a) characteristics of the resource; (b) characteristics of the resource user group; (c) characteristics of the institutional structure that constraints the behaviour of the resource users vis-à-vis the resource in question; and (d) external environment.

Each of these groups consists of a number of attributes that are mostly quantifiable. It is also posited that the interaction between these groups also contributes effectively towards the resilience of an SES. The attributes identified by Agrawal are presented in Table 1 (p 55).

The methodological plight of a researcher looking into the issue of resilience of an SES, or more specifically that of JFM, gets intense as one realises that:

> the total number of factors that affect successful management of commons is greater than 30, and may be closer to 40……Furthermore, because the effects of some variables may depend on the state of other variables and interactional effects among variables may also affect outcomes, any careful analysis of sustainability on the commons needs to incorporate interaction effects among many of the variables under consideration. As soon as we concede the possibility that between 30 and 40 variables affect the management of common pool resources, and that some of these variables may have important interactional effect, we confront severe additional analytical problems (Agrawal 2002: 65).

Perhaps, we have now reasons to understand the existence of a large number of micro-level analyses on JFM experiences in India and a near total absence of a comprehensive review of JFM at the national level. Murali et al (2002) report that 17 national level studies that covered at least more than one state were carried out on JFM till 2001 (specific cut-off date not mentioned in the paper), out of 200 odd evaluation studies carried out during the period. Importantly, none focused on the monitoring of JFM so that one could understand the dynamic interactions across the four major components of an SES and comment on the nature of resilience of the JFM systems.

5 A Suggestive MIS Framework

The decade of the 1990s passed by with emphasis mostly on legal and institutional parameters of JFM. Scholars are now arguing in favour of the need to understand functional aspects of co-management beginning with a premise that co-management is a continuous problem-solving process, rather than a fixed state, involving extensive deliberation, negotiation and joint learning within problem-solving networks. The approach may employ the following steps: (a) defining the social-ecological system; (b) mapping the essential management tasks; (c) clarifying the problem-solving process to the participants; (d) analysing linkages in the system; (e) evaluating capacity-building needs for enhancing the skills and capabilities of people and institutions; and (f) prescribing ways to improve policymaking and problem-solving (Carlsson and Berkes 2005: 65).

Given the insights gathered from Agrawal (2002) and the steps suggested by Carlsson and Berkes (2005), we propose an MIS to be generated and maintained at different levels that may add to the resilience of a

Table 2: Stakeholders Identified to Contribute to Different Components of MIS

Components	Vision 1	Vision 2	Vision 3	Vision 4
Resource system	Forest department at range level	Community and forest department at range level (jointly)	Community and forest department at block level with regular aggregation at range level (separately to facilitate cross-checks and enhance accountability of both stakeholders)	Community
Group	Forest department at range level	Community and forest department at range level (jointly)	Community	Community
Institution	Forest department at range level	Community and forest department at range level (jointly)	Community and forest department (jointly)	Community
External environment	Forest department at policy level	Forest department at policy level	Community and forest department range level with regular inputs from policy level (jointly)	Community and forest department (jointly)
Resource-group interaction	Forest department at range level	Community and forest department at range level (jointly)	Community and forest department (jointly)	Community
Resource-institution interaction	Forest department at range level	Community and forest department at range level (jointly)	Community and forest department (jointly)	Community

JFM system. Let us identify three distinct players who are not only to provide meaningful inputs to the proposed MIS, but also to utilise the information system to enhance the resilience of a JFM system. They are: (a) community members[5] of FPC; (b) forest department officials at the range level;[6] and (c) policymakers.[7]

The respective roles of these stakeholders will depend on the importance given to each of them in the decision-making process. Wyatt (2008) provides an interesting typology of four possible visions of co-managed forestry through involvement of the "First Nations" in Canada. The typology, though built around the perspective of involving the aboriginal tribes of Canada in managing forest resources, is very much valid in spirit with regard to the JFM introduced in Indian forests. One has to keep in mind that forests till today are managed by the State through the forest department in India. JFM is an effort to increase the level of participation of the communities living in and around them in the management process. Following Waytt, we may develop four different visions of co-management of forests in India. They are:

Vision 1: Forestry by communities: encouraging community to undertake forestry within the existing management system – the community members may provide labour in forestry activities and receive benefits in cash or kind;

Vision 2: Forestry for communities: the existing forest management system with a greater acknowledgement of and a place for the communities – continuation of the existing government regulations and tenure arrangements but introduction of flexibilities in encouraging participation by communities in managing forests, through, for example, providing certain harvesting rights and taking other forestry values into account;

Vision 3: Forestry with communities: based on significant modifications to existing forestry regimes to allow responsibilities of forest management to be shared on an equal footing between the communities and the department to ensure that the communities can manage their own interest and development goals – tenurial arrangements may be modified; and

Vision 4: Community forestry: forest management system in which the interest of the community is dominant and the communities are able to ensure that their interest is respected (Wyatt 2008: 177-78).

Available evidences suggest that JFM in India, during 1990, was following Vision 1. The modifications in the guidelines brought about in 2000 and 2002 were intended to shift to Vision 2, but perhaps not with much success, even though, the National Forest Policy of 1988 gives a faint indication of achieving Vision 3, if not Vision 4 in the near future. The enactment of the Tribal Forest Act (2006),[8] giving land right to forest dependent population staying in and around forests for generations is perhaps a step forward towards Vision 3. An implementation of the act in letter and spirit will realise Vision 4. Nayak and Berkes (2008) provide an interesting insight into the conflict between Vision 1 (present JFM position) and Vision 4 (traditionally, community managed forests but brought under JFM in 2002). The structure of MIS for JFM will change according to the vision. Table 2 (p 57) provides the suggestive variations in the management responsibility of different structural components of MIS according to changes in the vision.

As is evident from Table 2, the identities of stakeholders expected to contribute to different components of the MIS will vary according to the vision in mind vis-à-vis JFM. Under Vision 1, where communities participate only as wage labourers in return for some benefits in cash and kind, it will not be prudent to expect the members of the community to take up responsibilities of developing the MIS and maintaining them. The responsibility will solely lie with the officials of the forest department with range officers taking up the lion's share and officials at the policy level chipping in to develop the module on external environment. In case of planning for MIS with Vision 2, that recognises community's participation in management with no change in the existing state-centred management and tenurial system, the communities can join hands with the local level forest officials to develop the information system on all the modules, except that on external environment. Under Vision 3, the respective community and forest guard should develop independent databases on status of resource to facilitate cross-check and accountability of the intimate stakeholders, which are to be reconciled at the range level regularly, say, once every month. Other modules are better developed by the members of the community, independently for group characteristics and jointly with forest department officials located at relevant levels for the rest of the modules. A Vision 4 scenario would necessitate the creation and maintenance of the entire MIS by the community with regular inputs on external environment coming from policy level officials of the forest department.

6 Components of MIS: A Structured Perspective

This section attempts to provide a structure of the different components of the proposed MIS.

To begin with the resource system, it is necessary to appreciate that the literature is replete with several effective indicators that can be used to monitor the dynamics of a forest resource system. However, most of these acceptable indicators are centred around trees. The forest department during the British regime developed a very robust MIS for the resource system that was only linked to the trees either growing naturally or planted in a forest patch. A very meticulous system of recording the changes in a patch of forest right at the level of a compartment – the smallest unit in forest management – in the form of plantation journals was instituted. The name itself suggests that the records were maintained therein for the plantations raised by the forest department. These journals were updated annually. Every minute detail from growth and mortality of trees, thinning operations right up to the felling of the surviving trees when matured were recorded in the plantation journals. Information system on forest resource system should better be centred around a revival of religious maintenance of "plantation journals". However, a point needs to be clarified quite clearly at this point. Interested as they were in the productive importance of forests, the forestry management practitioners during the British period were not interested in maintaining similar rigorous datasets for the natural forests. Given the increased focus on protective services of forests, the same exercise has to be initiated for whatever patches of natural forests exists at present.

There is another issue to be considered as well. Forests generally constitute of three stories of vegetation. While the top storey refers to the trees, the lowest storey consists of grass and herbs and the middle storey is of shrubs. Depending on eco-regional variations, a particular forest patch may not be having the top storey – a grass land, for example. A productive perspective of forests will tend to classify such patches as bereft of forests which a protective perspective need not. The NTFPs through its phytosociological relationship with other floral and faunal species also influence the health and dynamics of a forest resource system. Data sets on forestry resources cannot afford the luxury of ignoring them.

In view of the present policy shift in favour of the communities living in and around forests, the dynamics of socio-economic characteristics of the groups highly dependent on forests requires continuous monitoring. The main components of the relevant data set would be the factors capable of influencing the livelihood security of the community both from within and from outside. The internal factors refer to the skill sets and asset bases of the people, while the external factors are the livelihood opportunities available away from forests.

The MIS on institutions should take care of the rules, norms and customs with their evolution and attendant changes over time for harvesting, using and selling of forestry resources. In addition the existing rules and the inter-temporal changes therein that govern availability and use of non-forest resources are also needed to be tracked. The interactive mechanisms can be identified through relevant analysis of the factors considered in the first three components mentioned above.

7 Conclusions

The paper began with a premise that JFM was conceived to add resilience to an SES. The analytical difficulties in effectively monitoring the change in resilience of JFM as an SES, following the existing literature, have been linked to the lack of an effective MIS that requires to intimately link a number of core components of an SES – the resource, the group, the institution and the external environment. Being exploratory in nature, the present paper only offers a schematic structure of the MIS without elaborating on its nuts and bolts (specific variables). However, keeping in mind that the decision-making process in a co-managed system is shared among the intimate stakeholders (community and forest department, in the present situation) in proportion to their respective rights and responsibilities, we identified variations in the share of responsibilities of the forest department and the community in creating and managing the database under four different scenarios of co-management. Taking cue from the practices followed in forest management during the British rule, we also identified some of the components that may be incorporated in the proposed MIS.

NOTES

1 Village level institutions for local self-governance.

2 A social-ecological system implies a set of people, their natural and human-made resources and the relationships among them (Janssen 2006; Anderies et al 2004 provides a conceptual framework of an SES, also see Janssen et al 2007 and Abel et al 2006).

3 Resilience has been defined from many perspectives like ecological, social, systemic, operational, sociological, economic-ecological and social-ecological. From a social-ecological perspective indicates the capacity of a social-ecological system to absorb recurrent disturbances so as to retain essential structures, processes and feedbacks (Adger et al 2005). The magnitude of resilience in a system is measured by its capacity to absorb disturbances under sudden and undesirable internal or external changes (Folke et al 2002: 34; Janssen et al 2007: 319) before the system redefines its structure by changing the variables (Gunderson et al 2002: 1).

4 The strength of such system depends on the factor – how resilient it is under unexpected changes.

5 People, not necessarily of tribal origin, living in and around forests.

6 The forest department in every Indian state follows a hierarchical pattern of jurisdiction. While the lowest unit of forest, called a compartment is looked after by a *van shramik* (forest worker), a forest guard is in charge of a block composed of a number of compartments. A beat, consisting of 5-6 blocks is looked after by a beat officer. A range comprises 5-6 beats and is managed by a range officer. A few ranges constitute a division looked after by the divisional forest officer. While the range officer is the ex-officio secretary of all the FPCs created in forests under his/her jurisdiction, the divisional forest officer (DFO) is authorised to issue the relevant government notification constituting an FPC. DFO is also empowered to disband an FPC if (s)he finds it necessary.

7 Conservator of forests (CF) handles 3-4 divisions and provides directions to the DFOs. Chief conservators of forests (CCF) and the principal chief conservators of forests (PCCF) are responsible for policy level decisions.

8 The Scheduled Tribes and Other Traditional Forest-Dwellers (Recognition of Forest Rights) Act, 2006.

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