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VILLAGERS AND THE USE AND CONSERVATION OF INDIAN FORESTS: THE ROLE OF JOINT FOREST MANAGEMENT

ABSTRACT

Provides a brief account of the development of the Joint Forest Management Scheme in India, especially in West Bengal, the state where joint forest management has been most widely adopted and which provided the genesis of the scheme that was adopted as part of India's Forest Policy 1988. The development, nature of and rationale for the scheme are discussed. Results to a survey of household heads in villages in the neighbourhood of state forests in the Midnapore region of West Bengal are reported. The survey provides information about the dependence of villagers on forest resources, the sustainability of current forest use as perceived by villagers, and reports their views about forest management issues, including the Joint Forest Management Scheme. The concerns of villagers about joint forest management are identified and analysed. It is suggested that some writers have been too ready to promote the sustainability and social welfare benefits of joint forest management as now practiced. Some of its important limitations are identified. While it is preferable to open-access, the system in India is as yet deficient in terms of communal and social management.

VILLAGERS AND THE USE AND CONSERVATION OF INDIAN FORESTS: THE ROLE OF JOINT FOREST MANAGEMENT

1. Introduction

Joint forestry management as practiced in India is a form of partial co-management of state-owned forests, forests that probably were communally owned in the distant past. Although Indian joint forest management involves some management input from villagers, it is not a form of social or community-based forestry[1]. The latter is a form of forestry involving communal ownership by the village and is solely under the control of the village.

This article outlines the development of joint forest management in India, suggests the reasons for this evoluation, giving particular consideration to the development of this system in West Bengal, the state where the joint forest management system is most widely used. It also reports results from a survey of three tribal Santal villages in the north Midnapore region of West Bengal. This survey was designed to obtain data from villagers about the degree and nature of their dependence on forest resources, the sustainability of current forest uses and practices as perceived by the villagers, and to provide an assessment of forest management issues, including the effectiveness of the Joint Forest Management Scheme. The outline and consideration of results from the survey are followed by analysis and discussion of issues raised in relation to joint forest management.

2. Development of the Joint Forest Management System in India, especially in West Bengal

2.1 Origin of the scheme

The traditional bias of Indian forestry has been to concentrate on raising revenue from timber production (Mishra, 1998, p.262). Within India, a government forest bureaucracy was created whose management of forests alienated local communities from their own ecosystems. However, policy directions began to change in 1998. India's 1988 Forest

Policy emphasised a participatory approach so as to take greater account of community objectives and environmental concerns. Without providing specific directives, the Union Government advised the state governments to share the responsibilities and benefits of forest management with communities in and around the state forests.

West Bengal has been a pioneer of the joint forestry management (JFM) movement in India (Hobley, 1996, p.60). JFM (a form of participatory forest management) has been widely adopted in West Bengal, especially in degraded lateritic areas of south West Bengal. In 1972, (long before India's 1988 Forest Policy), an Indian forester, A.K. Banerjee of Midnapore, undertook a pilot project in West Bengal known as the Arabari Socio-Economic Project in which 618 families from 11 villages participated (Harrison and Ghose, 2000; Harrison et al., 2001). In 1972, this Divisional Forest Officer in Midnapore, West Bengal, took over a block of 1272 ha of denuded forest for rehabilitation. Until then, the stumps left in the area had thrown up vegetative shoots every year that the local poor people cut and sold in the nearby market for subsistence. The value of the forest in terms of commercial timber production in 1972 was nil. In this period, there was no legal support in forest policies and laws for involving villagers in forest management. In addition to the lack of legal backing, the project was neither sponsored by the government nor by any agency. This forest officer divided 3,607 villagers into various groups and met these individually to explain that regeneration of degraded forest and their sustainable management could support livelihood of many villagers in the long run, and that both the villagers and the West Bengal Forest Department foresters needed to cooperate in these endeavours.

The Arabari Socio-Economic Project was widely adopted in several parts of West Bengal and its apparent success contributed to a large extent to the development of the 1988 Indian Forest Policy. With the introduction of the 1988 Forest Policy, informal participation of indigenous communities in forest management was converted to Joint Forestry Management (JFM). Under this system, the West Bengal Forest Department in conjunction with the village-based Forest Protection Committees (FPCs) started managing forests.

2.2 Nature and rationale of the scheme

A major policy shift occurred during the 1970s and the 1980s in India's forest sector towards a more decentralised and people-oriented forestry. Until 1988, the planned and scientific forestry practices of India mostly involved top-down management aimed at meeting 'national timber needs'. However, India's national forestry policies now recognise the symbiotic relationship between villagers and forests. One of the new institutional arrangements created to take account of this new focus is the Joint Forestry Management (JFM) program. Under this program, the state forest departments cooperate to some extent with local user-communities to protect and manage local forest resources.

As a result of centralised, state control of Indian forests in the past, user-communities became alienated from forest administration and management. Furthermore, restrictions on rights and access of villagers to forests adversely affected their lives and livelihoods. This alienation worked persistently against the forest conservation efforts of the administration, resulting in the forest management system being ill-equipped to cope with the enormous demands of the growing human and livestock population, industrialisation, urbanisation and overall economic development. It contributed to a perceived widening gap between demand for and supply of biomass for energy, fodder, timber and pulpable raw material from forest resources. This was instrumental in the formulation of the National Forest Policy of 1988, which was intended to assist tribals and other villagers living in and around forest areas in meeting their needs for fuelwood, fodder, forest food gathering, thatch and small timber needs.

Hobley (1996, Ch.2) provides a systematic historical account of the development of forest policy in India and considers 1894, 1952 and 1988 as important milestones (Hobley, 1996, p.62). The British policy, as formulated in 1894, was "to restrict and regulate access of neighbouring villagers to the forests" and the main objective was "to derive revenue for the state from the exploitation of valuable timbers" (Hobley, 1996, p.62). After India's independence the paramount interest of the state in India's forests was reinforced (cf. Tisdell and Roy, 1997). India's 1952 forest policy (post-

independence) regarded the national interest in forests to be paramount compared to that of the local people and the state's emphasis on revenue generation continued (Hobley, 1996, p.62). India's Forest Policy of 1988 indicated a new direction. This policy proposed that "forest products as a right to be reserved for use of neighbouring communities" and that "direct economic benefit be subordinated to the principal aim of ensuring environmental stability and ecological balance" (Hobley, 1996, p.62). Although India's 1998 policy involves a change in principle, actual changes in practice seem to be seem to be slow in coming. While improved access of neighbouring villagers to forests has occurred and their legal use of its forest resources has been ratified, revenue generation still seems to be a major goal of state forest departments and their direct economic benefits appear only to have been subordinated to other objectives to a very limited extent.

The National Forestry Policy (1988) in India envisages involvement of villagers in the development and protection of forests – *Involvement of village communities and VO's in the regeneration of degraded forests lands* (circular no: 6.21/89-F.P.). It stressed the need to determine how village communities, living close to forest land, could be given sufficient benefits to ensure their effective participation in the afforestation program.

The forest management guidelines issued by the Government of India arose from the reputed success of the pilot project (mentioned above) begun in 1972 in Arabari, in southern West Bengal. Vast areas of forests in the southern lateritic tracts of West Bengal had become virtually unproductive due to commercial overexploitation, illegal felling of trees for timber, unregulated fuelwood collection by poverty-stricken people, and overgrazing by village cattle. The main reason for introducing JFM appears to have been the hope that it would ameliorate such unsustainable use of forest resources by encouraging a participatory cooperative approach involving villagers and state forest departments.

In particular, it appears to have been aimed at reducing the illegal felling of trees in state forests by using members of the village-based Forest Protection Committees (FPCs) as

forest guards. The economic incentive provided for such cooperation was a quarter share for the villagers of net economic benefits for the sale of timber from the area of the forest adjoining the village, overseen by the village FPC to prevent theft of trees. Thus, it seemed possible that both villagers and state forest departments could benefit from this approach.

In practice, however, the JFM scheme is less successful than sometimes claimed (e.g. by Mishra, 1998), as is indicated by our survey of villagers participating in this scheme in West Bengal. The results of this survey and its implications are discussed later. However, it can be mentioned now that the economic incentive provided to villagers by the scheme for protecting trees is low. Furthermore, the scheme only covers, in most instances, a portion of forest resources (namely timber and in a few cases cashews) and the participation of villagers in forest management itself, such as in logging decisions and replantation is extremely limited. The participation of villagers in forest management is mainly confined to the policing of their forests in areas near their village.

Although Mishra (1998, p.262) suggests that villagers have become managers of forest in West Bengal as a result of JFM and that their indigenous knowledge is being integrated with the 'scientific' principles involved in modern forestry management, this was not supported by our fieldwork. In fact, tribal villagers complained that their forest management input was extremely limited.

2.3 Extent of adoption of the scheme in India, particularly in West Bengal

From Table 1, it can be seen that West Bengal has more than half of its forest area under Joint Forest Management and that adjoining Bihar has over a quarter. However, most Indian states only have a small proportion of their forest area under JFM. Altogether 16 Indian states have passed legislation to give effect to joint forest management (Hobley, 1996, p.59).

Table 1 **Actual Forest Cover and Area Under JFM in Various States of India, 1997**

State/UT	Forest Cover km^2	Area Under JFM km^2	JFM % of Forest Cover
Kerala	10334	20	0.19
Himachal Pradesh	12521	60	0.48
Jammu & Kashmir	20440	141	0.69
Karnataka	32403	339	1.05
Rajasthan	13353	244	1.83
Gujrat	12578	259	2.06
Madhya Pradesh	131195	3500	2.67
Orissa	46941	2960	6.31
Haryana	604	63	10.43
Andhra Pradesh	43290	6480	14.97
Bihar	26524	7103	26.78
West Bengal	**8349**	**4493**	**53.81**
Total	358532	25662	7.16

Primary Source: Society for Promotion of Wasteland Development (1998).
Secondary Source: Website of the Planning Commission of India, http://www.planningcommission.nic.in

In 1997, there were 3,289 Forest Protection Committees (FPCs) in West Bengal. They had 371,700 members and protected 4,493 sq km of forest land (http://www.iifm.org/databank/jfm/progress.html). The number of all women FPCs is twenty. Since 1995, an area of 3,023 ha of Sal Forests has been harvested in the state. In 164 FPC areas, a gross revenue of Rs 6.09 crores (10 million = 1 crore) was obtained after an expenditure of Rs 1.48 crores on extraction. The total one-fourth share from the final harvest distributed to the FPC members is Rs 11.5 million (Indian Institute of Forest Management website, http://www.iifm.org).

"Only degraded areas are to be covered under JFM program. The net benefits accruing from the forest produce are to be shared between the government and the members of the committee in ratio 3:1" (Indian Forest Survey, 1999). This implies that a quarter of the

net benefits are allocated to members of the FPCs. Because each family in a village participating in the JFM scheme usually has an equal number of members on the FPC, families in the village share village benefits from JFM equally.

While the introduction of JFM may well have reduced the illegal harvest of trees from state forests, nevertheless, at least in West Bengal, it has not been associated with sustained forest replanting. As can be seen from Table 2, the annual area planted with trees has fallen since 1991-92. In general, investment in replanting trees in state forests in West Bengal has declined. This was a source of complaint by many villagers interviewed for this study in south West Bengal. It may be that JFM has increasingly been viewed by the state as a substitute for investment in forest resources, but it is at best, a partial substitute. Furthermore, it might be noted that the tree species selected for forest plantations by the West Bengal Forest Department (WBFD) are not always those of greatest economic value to villagers. For example, 25 percent by area of its plantations in 1998 consist of exotic eucalypts. These are usually not favoured by villagers because of the adverse effect of eucalypts on non-timber forest resources, such as on grass cover and edible human food, and because they tend to lower the watertable (cf. Harrison and Roy, 2000). Plantations consisting of native *Shorea robusta* (Sal) and *Tectona grandis* (Teak), which constituted in 1998, 30 percent and 5 percent respectively of the WBFD's plantations by area, are more acceptable to villagers because they ensure greater amounts of non-timber forest resources for villagers.

Table 2 **Flow of Forest Plantation by all Public Agencies in West Bengal, 1951-99**

Period	**Area planted in 000 ha**	**Average per year**
1951-80	111.33	10.18
1980-85	155.90	31.18
1985-90	303.40	60.68
1990-91	62.15	62.15
1991-92	89.84	89.84
1992-97	387.37	77.47
1997-98	29.69	29.69
1998-99	18.05	18.05
Total	1157.73	24.12

Source: Based on NAEB, Ministry of Environment and Forestry, 1999.
Website: http://envfor.nic.in

3. Survey of Household Heads in Three Villages in West Bengal

In 2000, household heads of three villages located near or in forests in West Bengal were interviewed directly using a structured questionnaire. These three villages are located in the north Midnapore region north of Salbani, with Chandrakona Road being the nearest township. The general location of the survey area is indicated in Figure 1. The total sample consisted of ninety-six household heads, representing virtually all families in the villages of Atabanda (thirty-two household heads). Barabugpichla (twenty-nine) and Chandmura (thirty-five). The particular location of these villages is shown in Figure 2. Of these villages, Chandmura was most closely associated with the Arabari forest which, as mentioned earlier, was the scene of the earliest experiments with joint forest management in India.

Fig. 1 General location map for forest villages surveyed in West Bengal

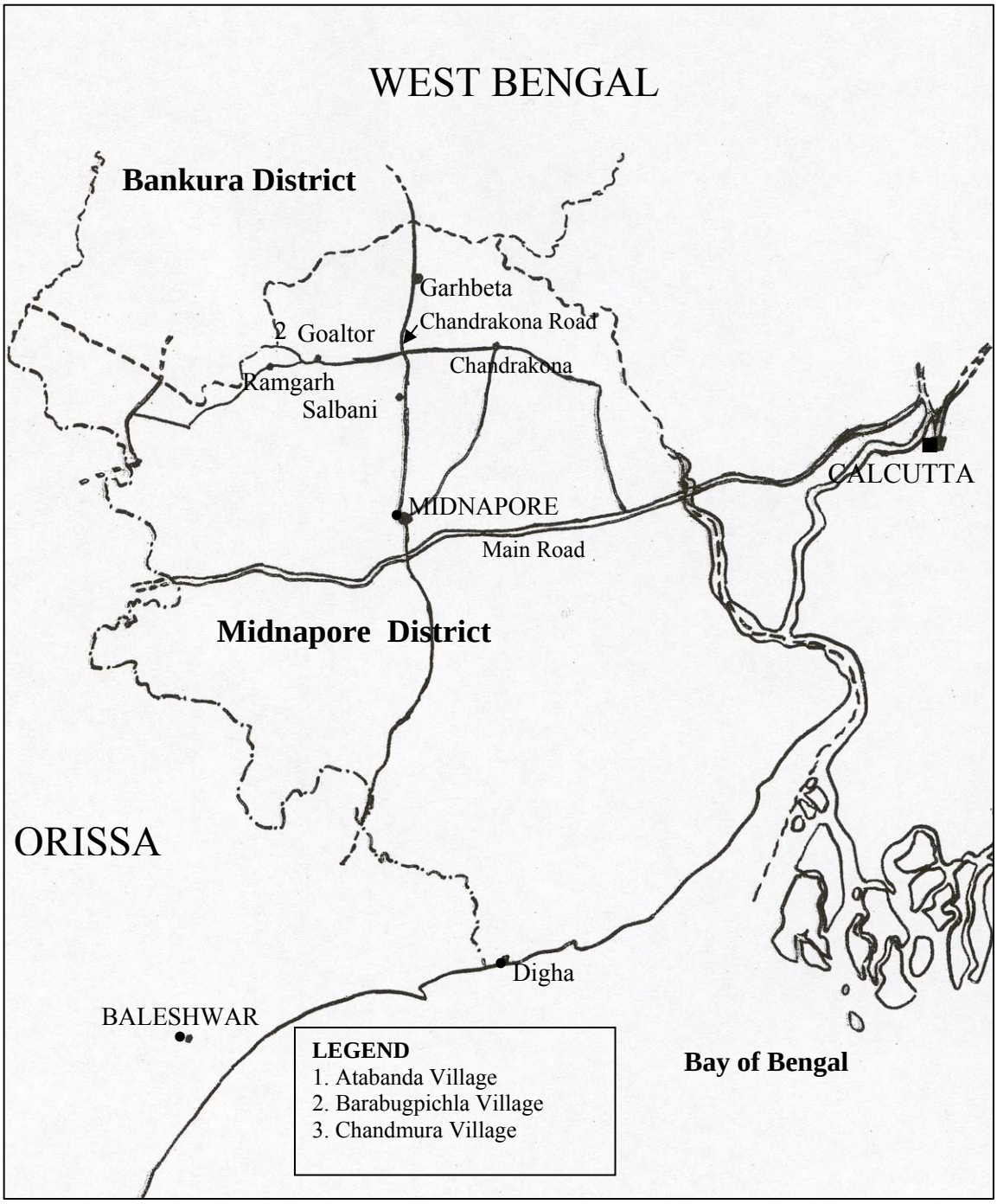

Figure 2 **Specific location of the forest villages (Atabanda, Barabugpichla and Chandmura) surveyed.**

The socio-economic conditions of these villages were rather similar. All villagers were Santals following the Sari religion and showed a high degree of economic dependence on

nearby forests. Most of the villagers perceived that they belonged to the lowest economic group in relation to their community reference group. Table 3 summarises the sample and socio-economic characteristics for the villages surveyed.

Table 3 **Sample and Socio-economic Characteristics for the Atabanda, Barabugpichla and Chandmura Villages**

Parameters	**Atabanda**	**Barabugpichla**	**Chandmura**
Name of the forest(s) used	Ghargra, Arabari	Barabugpichla, Moldangal, Birapatra, Bankumar	Maheshdubai Backamati
Beat and Range	Arabari	Kiyamacha, Nayabasat	Arabari
Tribe (Santal)	Scheduled Tribe	Scheduled Tribe	Scheduled Tribe
Religion	Sari	Sari	Sari
No of sample	32	29	35
Average family size	5.5	4.48	4.4
Average number of children	1.6	1.5	1.7
Families with dependent adults	13 (1each)	7 (1 each)	7 (1 each), 1 (2 dependent adults)
Dependency ratio*	0.86	0.73	0.80
Upper economic status (perceived)	5	3	2
Middle economic status (perceived)	1	12	2
Lower economic status (perceived)	26	14	31

*Dependents in relation to non-dependents.

4. Economic Dependence of Villages Surveyed on Forest Resources

4.1 Cash dependence

Where villagers are located in or near state forests in India, they are usually highly dependent on forest resources for their economic welfare. More than 80 percent of households in the villages surveyed here obtained more than half their cash income from forest resources, e.g. from products such as Sal leaves used for producing disposable plates for cash sales. The distribution of reported degrees of dependence of households in these villages on cash income from forest resources as shown in Figure 3. This distribution is based on eighty-nine responses since nine household heads did not provide a response.

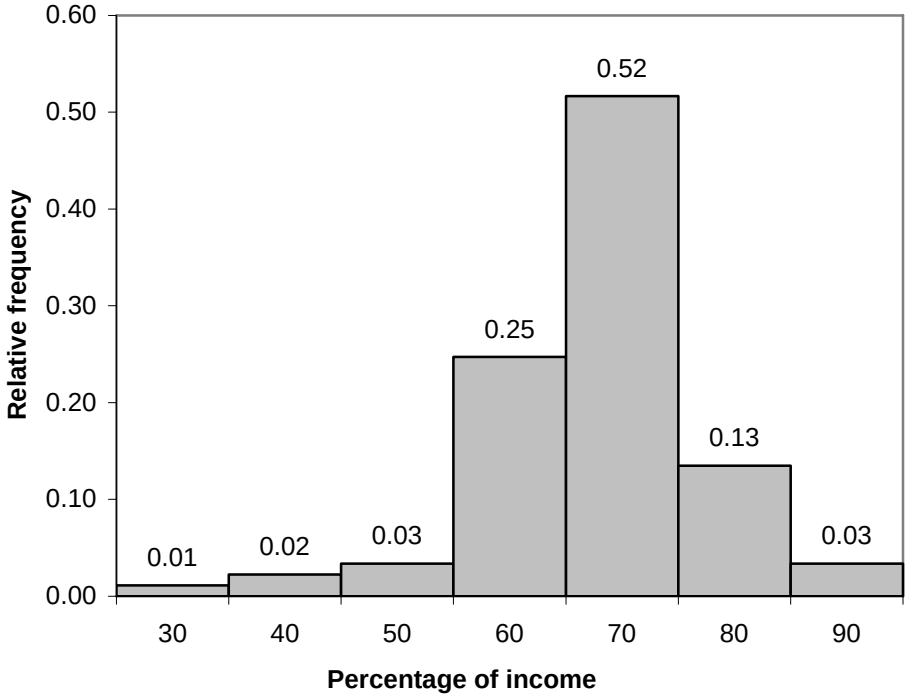

Figure 3 **Percentage of family household cash income from forest resources, relative frequency of responses, Atabanda, Barabugpichla and Chandmura combined.**

4.2 Dependence on forests to meet basic family needs directly

There was also a high degree of dependence of the villagers on the forests to meet basic needs or economic requirements directly. Household heads were asked whether their household showed a high, medium or low degree of dependence on forests for various products for consumption. On the whole, it was found that dependence was relatively high for building materials, for thatch material, for food, for fuel and for grazing livestock with dependence being somewhat less for herbs and medicine. Weighting a low response by 1, a medium one by 2, and high one by 3, the weighted average level of dependence is shown in Table 4.

Table 4 **Weighted average dependence on forest resources as reported by respondents in Atabanda, Barabugpichla, Chandmura, 2000**

Resources	Weighted average dependence
Building Material	2.88
Thatch Material	2.58
Food	2.46
Fuel	2.41
Grazing of Livestock	2.18
Herbs and Medicine	1.76

4.3 Gender and the relative use of forest resources

Respondents were generally agreed that women made much more use of the forests than male villagers. Although 5.2 percent of household heads did not answer this question, the 94.8 percent who did stated that women made greater use of the forests than men. Furthermore, all those answering the question agreed that when women are able to use the forest and contribute more to the family's livelihood, they obtain more respect in their family. In declining levels of dependence, it was found that women were most dependent on the forest for collecting fuel, then food, then grazing of livestock, collection of herbs and medicine, followed by collection of building material and then thatch material. The latter two activities tend to be male activities. The overall result is that village women are highly dependent for their family economic contribution on forest resources in these villages, and much more so than men.

4.4 Seasonal dependence on forest resources

All respondents agreed that they were very highly dependent on forests for their livelihood in some months of the year because of lack of availability of other economic opportunities. In order to see how important forest resources might be for 'insurance' purposes, respondents were asked: "In terms of drought or a difficult season is your dependence for survival or livelihood on the forest high, medium or low?" Ninety percent of respondents said it was 'high', 9 percent reported it as 'medium' whereas only 1 respondent, 1 percent said it was 'low'. Thus the forest plays an important role in the social security of these villagers. The importance of forests in providing social security

for many villagers in developing countries has been previously pointed out by Chambers (1987, 1988) and Chambers and Leach (1989).

5. Sustainability of Current Forest Use as Perceived by Village Respondents

Respondents were asked whether they believe that their forests will contribute less to the income of their family in the future. Eighty-one percent said 'yes'. They mainly thought so because of declining forest cover and expected a rise in local population leading to greater competition for forest resources. The nineteen percent who said 'no' where mainly of the view that their future income could be maintained by better forest management and by the planting of cashew trees in the forest.

5.1 Specific threats of identified forest practices to livelihood

Nevertheless, all respondents stated that there were significant threats to their family's livelihood from a number of forest practices. Logging (which may be interpreted as excessive cutting of trees from the perspective of villagers) was ranked as the most serious threat, followed by reduction in forest size, overgrazing and others. Respondents were asked to indicate whether they regarded each of these forest practices as serious, medium, low or no threat. The responses are summarised in Table 5. Weighting the responses depending on the perceived magnitude of the threat by 3, 2 and 1 respectively, the weighted average pattern shown in Figure 4 emerges. Note that it is possible that the size of forest may have been interpreted by respondents as the size of trees in the forest. In any case, logging practices, failure to replant trees, reduction in forest size and overgrazing were all considered serious threats to the livelihood of families in these villages.

Table 5 **Threats posed by various forest practice to family livelihood in the three villages surveyed**

Forest Activity	Ranking of threats	Frequency of response	Relative frequency %
Logging	Serious	86	89.6
	Medium	10	10.4
	Low or None	0	0
	Total Response	96	100
Failure to replant trees	Serious	67	69.8
	Medium	29	30.2
	Low or None	0	0
	Total Response	96	100
Reduction in forest size	Serious	34	35
	Medium	61	64
	Low or None	1	1
	Total Response	96	100
Overgrazing	Serious	7	7.3
	Medium	82	85.4
	Low or None	7	7.3
	Total Response	96	100
Others*	Serious	5	12
	Medium	33	78
	Low or None	4	10
	Total Response	42	100

***** Atabanda had 7 observation for others and Barabugpichla had none—however, Chandmura has 35 (all) responding observations.

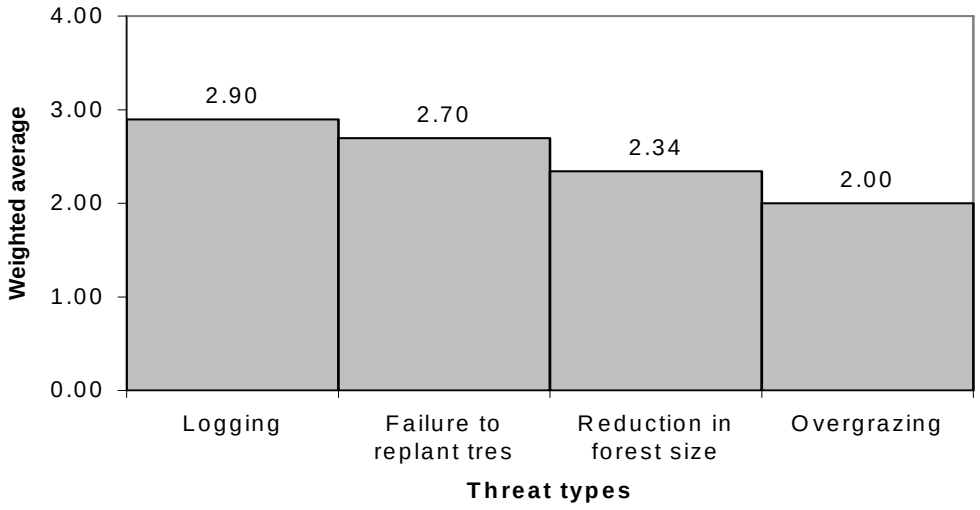

Figure 4 **Threat to family livelihood of various forest uses**

5.2 Trends in variety of products for consumption available from the forest

Those interviewed were asked whether or not the variety of products available to them had increased, decreased or had been constant in recent years. One person interviewed did not answer. Of the 95 respondents answering, the majority (63.16%) said that it had declined whereas the remainder believe that it had increased mainly due to replanting of timber trees and the planting of cashew trees.

5.3 Trends in the variety of wild animals and plants present in the forest - that is trends in biodiversity

All respondents were of the view that biodiversity had declined in their forest. This they attributed to such factors as a decline in forest cover combined with illegal cutting of trees. They suggested that this reduced available food for animals. An additional cause mentioned was the killing of animals. In this area, at least, it seems that the introduction of the JFM scheme is negatively associated with the preservation of biodiversity. While the relationship may not be a causal one, it seems that the JFM scheme has not stemmed a decline in forest biodiversity.

In particular, it might be noted that our survey results do not support the view of Mishra (1998, p.263) that joint forest management has contributed positively to the preservation of biodiversity. Mishra (1998) specifically rejects the view of Robinson (1998) that collaborative or joint management of natural resources is likely to result in a loss of biodiversity in the long term. The fact of the matter seems to be that so far JFM has not stemmed a decline in biodiversity in the forests of West Bengal. A final assessment, however, requires more evidence.

5.4 Demand by villagers for forest-use value

It is probable that biodiversity *per se* is not major goal for villagers. They appear to be most interested in changes in forest husbandry which increase the use-value of the forest to them. They suggested more planting of trees of greater use value to them such as Sal which provides valuable by-products for villagers and Amlaki, the fruit of which is eaten raw or pickled, consumed at home and also sold. More Neem trees were also favoured for

purifying the air and these also produce valuable by-products which can be sold by villagers. In addition, the villagers believed that they would benefit by increased tree cover to improve conditions for the growing of wild mushrooms, potatoes and other vegetables as well as herbs and fruit trees. The assignment of more state forest land for social forestry[1] was also favoured.

It is reasonable to conclude that current forest practices occurring under the JFM scheme are not maximising the value of forests from the perspective of villagers. Furthermore, the system seems inadequate to ensure sustainability of village economic benefits from the forests and it has failed to stem a decline in the variety of wild animals and plants available in the forests considered here as part of our survey in West Bengal.

6. Forest Management Issues and Forest-Dependent Villages

Villagers were asked if they had any customary right to use their nearby forests and 95.87% of respondents said 'yes' with the remainder answering in the negative. In fact, in West Bengal, because all the villagers interviewed belong to the scheduled Santal Tribe, all have rights to traditional uses of the forests, such as the use of it for the type of economic activities listed in Table 4. However, none had the right to felling of trees for commercial timber sales. The WBFD reserved this right exclusively for itself.

Villagers were asked if the Joint Forestry Committee (Joint Forest Management Scheme) had improved the sustainable management of forests. The majority (96.8%) of those responding (93) said 'yes' and 3.2% said 'no'. Three household heads did not respond. Basically Joint Forestry Management was seen as a forward step, and the main reason given was that it reduced illegal felling of trees.

All, except one family head, said that families received 25% of net revenue from the sale of timber in their forest beat (area). The one saying 'no' was from Barabugpichla and may have said 'no' because in that village the village council decided to use the last payment allocated to the village FPC for school building purposes. So it was not assigned to individual families.

Nevertheless, when respondents were asked whether the income received as a result of the JFM scheme was sufficient to make them want to protect the forest from illegal timber felling, three did not answer, 83 said 'no' (89.25% of those answering) and 10 (10.75% of those answering) said 'yes'. It can be concluded that as far as these villages are concerned, the JFM scheme provides insufficient economic incentive to most villagers for them to want to prevent illegal taking of timber. In addition, all household heads who answered the question (93 out of 96) said that they did not get a fair share of the income from timber sold from their forest. They were concerned, for instance, that 'deals' were made involving forest officers in which the price paid for the timber was below its market price.

It should be noted that income from harvesting timber is not continuous in all forested areas. This means that sometimes a village has no income from the JFM for several years. This has been the case for Chandmura village which relies on a part of the Arabari Forest, because its relevant forest area is relatively degraded. The villagers of Chandmura are relatively poor with only one member having employment which brings a regular cash income. In these circumstances, the incentive to cooperate in illegal timber gathering is strong.

Despite the shortcomings of the JFM scheme, all respondents agreed that the scheme gives a higher return from logging and more benefits than non-protected forests, and that planted trees are more protected in state-controlled forest than in non-protected forests and that the former forests maintain greater capacity to assist poor families than the latter ones. All respondents believed, however, that forests would be better managed and provide greater returns to villagers under NGO management.

No evidence was found for the 'grassroots' village-based governance of the use and management of forest resources to which villagers had customary rights. There appears to be no effective mechanisms of governance for the allocation of use-rights between families within a village so *de facto* common-access to non-commercial timber resources seems to exist.

No strong governance mechanisms are present for regulating the management of forest resources used by the villages surveyed here in West Bengal. Furthermore, the villagers have a very limited input into management of the WBFD of forests for timber production. Their role is virtually restricted to helping protect forests against illegal harvesting of timber for commercial use. They have virtually no say in the extent of replanting of trees and the species planted. Furthermore, little silviculture seems to be practiced by WBFD. In informal interviews, the tribal groups interviewed complained of lack of consultation by WBFD in relation to forestry management decisions. In contrast to claims by Mishra (1998), there was little evidence that indigenous knowledge was utilized in such decisions.

Most villagers interviewed believed that there was inadequate investment in tree planting. They agreed that, in principle, a fraction of the net returns from commercial timber harvesting should be invested in replanting and some suggested they would be prepared to forego a fraction of the village share of FPC funds to contribute. Declining levels of investment in tree planting in West Bengal in recent years are suggested by the figures in Table 2.

7. Discussion of Concerns about Joint Forest Management

While the virtues of India's Joint Forest Management scheme have been widely claimed (e.g. Mishra, 1998), our survey and interviews in West Bengal indicate that there are several issues of concern. Its shortcomings can be summarised as follow:

(1) While the JFM system reduces, to some extent, illegal cutting of forest trees, it does not eliminate it. Partly this is because the economic benefits obtained by villagers are low and shared by a number of villagers in the same village and by several villages in the same forest beat. In fact, as a forest becomes less productive, the incentive of villagers to illegally cut trees may increase. It seems that officers of WBFD are occasionally accomplices in such activities.

(2) Replanting of trees (and investment in silviculture) is entirely dependent on funds available to WBFD and its willingness to allocate funds for investment purposes. Villagers have little control of such activities. Most villages interviewed in south

West Bengal were of the view that the rate of harvesting of forest trees exceeds the rate of replanting, so forest cover is declining and the level of income from use of trees for timber is unsustainable. There was wide support from villagers for the suggestion that a proportion of net income from timber sales in their forest area be used for forest replanting and investment.

(3) The management goals of WBFD are unclear but it seems that in the forest area surveyed its goal is to 'maximise' the value of its timber sales. Its main emphasis in its management is on commercial timber yields with the value of non-timber products being an unimportant policy consideration[2]. This is a reflection of the fact that in this particular area, it only receives income from sales of trees for commercial purposes and obtains no income from non-timber products. However, the latter products are very important contributors to the economic welfare of villagers. This can lead to conflicts in forest management between forest-dependent villagers and the WBFD. This can be illustrated by Figure 5.

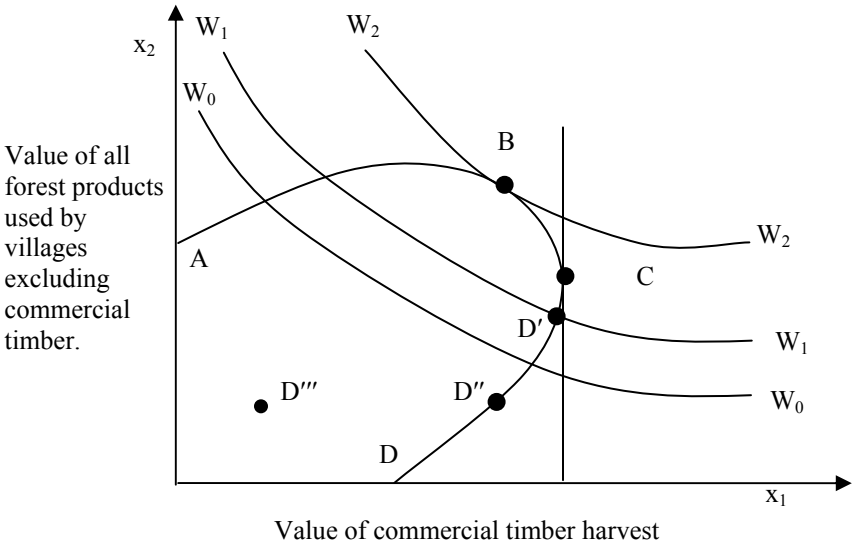

Figure 5 **Scope for conflict and cooperation between villagers and WBFD**

In Figure 5, the curve ABCD represents the trade-off frontier between commercial timber supply and all other products utilised by villagers and the indifference curves marked W_0W_0, W_1W_1 and W_2W_2 represent the collective preferences of the villagers. The ideal

combination of products from the villagers' point of view corresponds to B but given that WBFD preference it to maximise the value of commercial timber production, its preferences is for the combination at C. If the WBFD is able to achieve point C, then welfare of villagers is below its maximum attainable level.

There is, however, no guarantee that the WBFD will be able to achieve point C. Even with the help of the JFM scheme the best it may be able to do is to achieve the combination at point D′. This, however, is superior both from its point of view and from the point of villagers to the combination at D″ which might be the point achieved by the management strategies of WBFD in the absence of JFM. Open-access might result in a combination at point D‴ which is worse from the point of view of villagers than all the other alternative possibilities. The conceptual implications of this analysis accord with the survey responses obtained.

Furthermore, Figure 4 helps to emphasise the point that WBFD is not involved in total joint forest management with villagers. The WBFD only manages one type of resource in the forest and villagers the others, but there is no coordinated management of all the resources and village mechanisms of governance of those resources not managed by WBFD are weak.

The concept of total economic value of forest use and management (see, for example, Harrison, 2000) can be used to raise a further issue: joint forest management by state forestry departments and villagers, even if holistic, is unlikely to maximise the total economic value (TEV) of forest use and management. In such cases, only two sets of stakeholders have an influence on forest-use decisions, namely the relevant forestry department and forest-dependent villages; the general public and other interest groups are not represented.

In such cases, direct use of forest resources is likely to be favoured both by forestry departments and villagers. Off-site economic values are likely to be ignored. Perhaps this issue can be illustrated by Figure 6. There the total economic value of the management of

a forest for producing commercial timber is considered as the independent variable. Possibly a state forest department would wish solely to maximise the value of commercial timber supply. But villagers will obtain greater TEV by less emphasis on this goal, notionally an emphasis of x_1 percent in Figure 6. However, when all parties, including the general public are considered, the TEV for use of the forest for commercial timber production might be like the curve GHJ. This indicates that the maximum total economic value of the forest under consideration for commercial timber is achieved when the degree of emphasis on commercial production of timber is only x_0 percent, that is less than the villagers' emphasis on this aspect, and much less than the likely emphasis of a state forest department on commercial timber production.

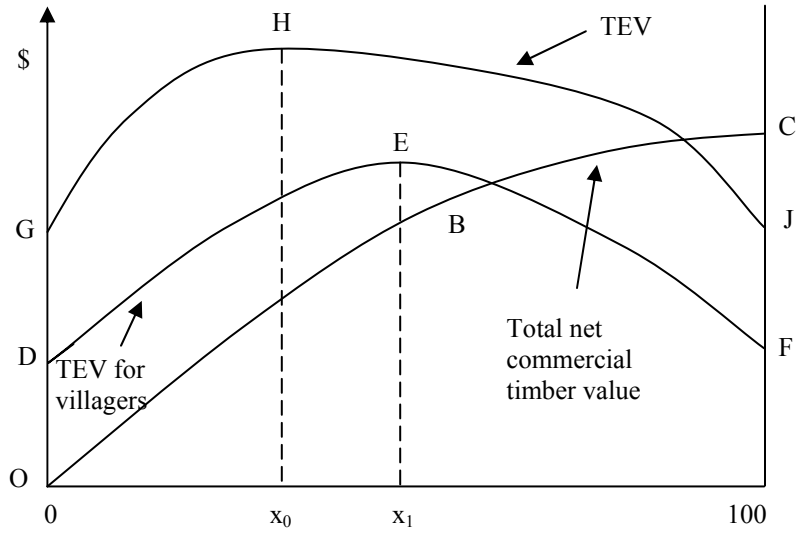

Figure 6 **Joint forest management is unlikely to maximise the total economic value of a forest**

8. Concluding Observations

In some parts of India, villagers, particularly tribals, remain heavily dependent on forests for their cash income, basic needs and survival. While in the distant past, most of these forests were communal property, they were assigned to the state following Britain's

colonisation of India, and after India's independence the state still continued to 'own' these forests (cf. Tisdell and Roy, 1997) In practice, state forest departments have tried to manage these forests to maximise income from commercial timber production.

As time progressed, it became increasingly evident that this goal could not be achieved without the cooperation of villagers in and near state forests. The JFM scheme recommended by the Union Government was intended to help rectify this situation and possibly was designed mainly to reduce the illegal harvesting of trees for commercial purposes.

As outlined above, India's system of JFM is a very incomplete participatory scheme and India's state forest system still seems biased in the main to the harvest of trees which can be sold for cash by India's forest departments.

Nevertheless, India's JFM is generally agreed to result in socially superior resource outcomes compared to *de facto* open-access. At the same time, corruption threatens the system. Ironically, the temptation for corruption and illegal logging seems highest in the most degraded or least productive forest areas. In addition, in West Bengal, the seemingly low level of investment in forest replanting and silviculture is of concern. It could be partly a result of state dominance of forestry and the possible siphoning off of funds by the state for other uses.

This study also found (in the villages surveyed) an absence of grassroots communal mechanisms for the management of those forest resources over which the villagers had effective control. Possibly such mechanisms existed in the distant past but they do not seem to be present now. Thus, in this case, beneficial communal management of those natural forest resources shared by villages is lacking. It seems that the type of beneficial communal governance envisaged by Ostrom (1990) has yet to emerge or re-emerge in many Indian villages heavily dependent on forest resources.

9. Notes

1. For a useful distinction between social forestry and joint forest management see Hobley (1996, p.63).
2. This may appear to be inconsistent with India's Forest Policy 1998. However, this policy is merely a recommendation of the Union Government. West Bengal has complied partly with this policy. Access of villagers in the neighbourhood of state forest to their forests has been legalised along with their direct use of forest resources, except trees intended for commercial sales, and in some cases, cashews to be sold commercially. These remain the property of the WBFD but under JFM, villagers receive a quarter share of the net income from sales of this produce by the WBFD.

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