Deeper Roots of HISTORICAL INJUSTICE

Trends and Challenges in the Forests of India

Ramachandra Guha • Nandini Sundar • Amita Baviskar •
Ashish Kothari • Neema Pathak • N. C. Saxena • Sharachchandra Lélé •
Don G. Roberts • Smriti Das • K. D. Singh • Arvind Khare

RIGHTS RESOURCES

6

Economics Incentives for Forest Management

Products in Hand or Services in the Bush?

SHARACHCHANDRA LÉLÉ

IT WOULD NOT BE AN exaggeration to say that the major focus of the debate on forest policy in India since the 1980s has been on whether and how to transfer control over forests to local communities. Interestingly, both the proponents of such transfer or decentralisation and its opponents have assumed that rural communities are substantially dependent on forests for incomes and livelihoods. The proponents of greater devolution have cited the substantial evidence of forest dependence that has emerged from various studies to argue that access to common pool resources including forests is vital for rural livelihoods. The assumption that rural communities or "forest-fringe" communities are forest dependent, and hence they are eagerly awaiting the transfer of forest management to their hands has been what I call the 'zero-th' assumption in the series of assumptions on which the concept of Joint Forest Management programme rests (Lélé 2001b). The Tribal Forest Rights Act, in seeking to facilitate individual hamlets taking over rights and responsibilities over individual forest tracts, makes the same assumption—that once their tenure over agricultural land and dwelling space becomes secure, forest-dwelling communities are waiting to take control and start managing 'forests as forests'.[1] Interestingly, the opponents of decentralisation, primarily the forest bureaucracy, have also indirectly supported this proposition

by always citing the 'pressure of population on forests in the form of grazing and firewood collection as the major reason for forest degradation.

Yet, taking a step back and looking at the larger context of the Indian rural economy, one wonders whether this assumption needs to be re-examined. The larger context is that the forest sector's contribution to the national GDP is tiny (1.1 percent in 2001) and declining decade by decade (World Bank 2006, chap.2). The larger context is also that the only heavily forested regions of the country which are not also impoverished, such as the Western Ghats, are those where in many portions forests have been replaced by plantation crops such as coffee, tea and rubber.[2] The still larger context is one of continuous intensification in the agricultural sector, of conversion of rainfed agriculture into canal- and bore-well-irrigated agriculture, thereby leading to increased cropping intensities and shifts towards commercial crops. It is one where rural development programmes almost exclusively focus on intensifying agriculture and also on developing non-land based activities. The even larger context is one of a national economy growing at nine percent per annum, the growth driven almost entirely by the industrial and service sector and leading to rapid urbanisation.

This is not to say that rural communities in forest-fringe areas or 'forest dwellers' (to use a more recent but somewhat fuzzier term) are not forest-dependent (although this is another fuzzy term). Nor is it to argue that the off-site "environmental" benefits of forests are insignificant, whether in economic terms or otherwise. But in a situation where on the one hand the transaction costs of collectively managing forests, even at a local level, are often quite high, and on the other hand, the economic returns from alternative uses of forest lands, such as horticulture or quarrying, are increasing as well, one should ask whether the returns to local communities from managing forests as forests will sufficiently outweigh these transaction and opportunity costs.

At another level, while the JFM programme has lost steam, the question of whether it is worthwhile for some larger aggregate of society to retain 'forests as forests' is cropping up repeatedly, again in an era of rapid 'economic growth' wherein the pressure to convert forests to non-forest (mining, dams, bio-fuel plantations) is rapidly growing. While the Supreme Court has supposedly put a high premium on such conversion by insisting on a payment of "NPV" (net present value) of Rs.5 to Rs.9 lakhs per ha of forest converted (see Anonymous 2005), the dramatic increase in the number of cases and extent of land actually cleared after paying this premium shows that the economic value of alternative uses is often being thought to be higher. In this economistic ambience, many donors, bureaucrats and even civil society people are championing the idea of 'payments for ecosystem services' (PES) as the solution to all problems. The World Bank has proposed experimental Global Forest Carbon Partnership Fund, and is

expecting that $500 million will flow through this fund over the next five years as payments to communities and governments in tropical countries that are willing to take on forest conservation.

It is in this context that I am exploring the question of economic incentives for forest management in India. Where and under what conditions are local communities or their representatives likely to get enough economic returns—whether from tangible products or intangible services—that they will be willing to (and able to) manage "forests as forests"? Is it really the case that the assumptions underpinning the earlier decentralisation paradigm need drastic revision? Is it really possible that we can jump from an unsuccessfully implemented decentralisation programme to a PES programme? I begin by discussing briefly the nature of direct and indirect benefits that society derives from forests, the manner in which they are produced and relate to each other, and the manner in which they are distributed spatially. This helps nuance the idea of 'forests as forests' and better identify the nature of the incentive problem: returns from what, for whom, and why relevant. I then try to summarise what seem to be emerging trends in the answers to these questions for different direct and indirect benefits. Finally, I examine the institutional conditions under which such returns can actually be captured, and the implications for forest policy in the country.

The Nature of Forest Ecosystem Benefits

Society derives various material and non-material benefits from forests. These may be broadly classified into directly harvestable products and indirectly provided services.[3] The directly harvestable products include:

- Timber and softwood
- Firewood, grass and other grazing material
- Other non-timber forest products (NTFPs) including fruit, nuts, bark, leaves, gum, etc.

The indirect services primarily consist of:

- Watershed services (hydrological regulation and soil conservation)
- Carbon sequestration
- Biodiversity conservation
- Pollination services and micro-climate regulation for agriculture

These products and services are represented in the columns of Table 1.

However, the term 'society derives' hides one key feature, viz., that the benefits are not at all homogenously or uniformly distributed across society, but are

they only captured (or even capturable) by just forest-dwelling communities. Different communities or individuals derive different parts or types of these benefits. And these communities are at different physical and social distances[4] from the forest. One simple classification of beneficiaries, that may be relevant to the question of forest management, is 'local' versus 'off-site' beneficiaries—those who can engage directly in forest management and those who cannot. Or one may prefer a 3-level classification—local, regional and global—which is the classification used in Table 1, using 3 different colours. Of course, the term 'local' may also hide too much difference. However, we will use a 3-level classification here for illustrative purposes and take up the question of local-level difference in the next section.

Table 1. Tradeoffs Between Benefits and Beneficiaries from 'Forest' and 'Non-Forest' Ecosystems

LAND USE TYPE		FOREST ECOSYSTEM PRODUCT or SERVICE								
		Timber	Fuel-wood	Leaf manure	Fodder	"Minor" Produce	Hydrological regulation	Soil Conser-vation	Bio-diversity	Carbon seques-tered
"Forest"	Dense "natural" forest	0	++	++	0	+++	+++	+++	+++	+++
	Dense lopped forest	+	+++	+++	+	++	++?	++	++	++
	Open tree savanna	0	++	++	++	+	+?	++	+	+
	Pure grassland	0	0	0	+++	0	+++?	++	+	+
	Timber plantation	++	+	+	0	0	+	+	+	+++
"Non-forest"	*Coffee plantation*	+	+	+	0	0	++?	++?	+	++
	Terraced paddy	0	0	0	++	0	+?	+?	?	0
	Slope (dry crop) cult.	0	0	0	+	0	0?	-	?	0
	Barren land	0	0	0	0	0	-	-	0	0

Note: The dark gray colour corresponds to 'local' beneficiaries; light gray to regional, and medium gray to global. The land use types and colouring pattern above represent a typical situation in the Western Ghats forests of India (see Lélé, 1994 for details). Note also that 'carbon sequestered' is a stock benefit, not the same as the [illegible] sequestration, which would perhaps be highest for timber plantations.

There is some correlation between the location of the beneficiary and the type of benefit, although it is modified by social arrangements. All products are harvested 'locally', i.e., in the forest, and then consumed either locally or elsewhere. Whether local communities benefit from this harvest or not depends on the configuration of forest rights and other arrangements. For instance, most forest-fringe communities in India (excepting some in the north-east) have not had rights over timber, softwood or many of the valuable NTFPs. But, in theory, it would be fairly easy for local communities to be given all timber rights and for them to capture the economic returns from timber sale to regional economies.[5] Similarly, while some services such as pollination, micro-climate regulation and groundwater recharge do benefit the agricultural communities on the forest fringe, a significant portion of the watershed service benefit may flow to off-site beneficiaries, in this case communities living downstream in the river basin. And of course the climate change mitigation benefits of carbon sequestration accrue to the entire global community. The beneficiaries of biodiversity conservation are much more diffuse, because the benefits themselves are fuzzy. The aesthetic and cultural values from biodiversity conservation may be derived by outsiders, but only when they come to the forest, in which case local communities or forest managers may be able to obtain some benefit by extracting a toll.[6] However, the 'existence value' of biodiversity flows to only those who care about it in the first place, which is a fuzzy set of beneficiaries.

Not only do different benefits accrue to different communities, but the benefits are also never simultaneously maximised—there are always tradeoffs. These tradeoffs are illustrated in Table 1.[7] Maximising biodiversity conservation requires reducing or eliminating timber extraction, and maximising fodder production may require reducing tree biodiversity and even firewood availability. Note also that even socalled 'non-forest' landuses usually generate some magnitude of some of the benefits that forests generate. And certainly non-forest landuses generate other subsistence benefits (food from agriculture) or monetary ones (money from golf courses). And since different benefits accrue to different beneficiaries, we come to the crux of the forest management problem: What forest management regimes and indeed what boundary between forest and non-forest uses would be a) workable and b) constitute a fair balance[8] between the needs of different benefits and beneficiaries? (see Lélé and Srinidhi 1998 for an elaboration).

Answering the questions of both workability and fairness has been attempted by economists. While my focus is on the workability question, it is becoming increasingly clear that normative decisions are being taken using an economic calculus. For instance, the Supreme Court's decision to impose NPV payments, although meant to be a charge imposed after a decision about conversion is taken, is in practice amounting to a 'pay and convert' approach (Kohli 2008). Similarly,

states with large forest areas are now making strong demands for higher allocation or special allocation of funds to compensate them for providing ecosystem services to downstream states or the nation at large. Understanding the logic and limits of both types of arguments is therefore necessary. This will require us to make a detour into the concepts of economic value and incentives and how they may relate to forest policy and management today.

Conceptualising Economic 'Value' and 'Incentives'

In the previous section, we talked about some broad variations in magnitudes of benefits without invoking monetary units per se. Why does the discussion often veer towards thinking of these benefits in economic terms? What is to be gained by imposing an economic lens? In the absence of an economic denominator, it is of course hard to see which forest management regime is 'superior', i.e., socially more desirable, because units of fuelwood cannot be compared with units of fodder, NTFPs or hydrological regulation. Economics provides a way of adding and subtracting, of making 'on the whole'-type arguments.

Whether imposing such a lens is empirically reasonable and normatively acceptable is of course a matter of debate. But even within economics, there is not one economic lens but at least two different lenses (or two shades of the same tint): one of micro-economic analysis and one of welfare economics. And these relate to two different ways of approaching the forest problem. In one approach, the idea is to understand what drives the decisions of forest users. It essentially argues that forest users will do what is economically beneficial for them, which means that they will add the economic returns from different benefits that accrue to them (columns of the same colour in Table 1) to come up the aggregate returns from each landuse regime, and then compare across regimes to choose the one most economically beneficial to them. This is a descriptive approach, which, however, has implications for forest management policy: if local forest users are to have a greater say in how the forest is to be used, then they will choose those uses that most benefit themselves, i.e., maximise local benefits—e.g., either by choosing forest management regimes that prioritise firewood and grazing or by converting the landuse to a more beneficial type such as horticulture or agriculture (or quarrying).[9] If, as the matrix suggests, there is divergence or mismatch between the interests of local and offsite beneficiaries, then offsite benefits will reduce (the workability question). Or, to put it simply, if people are not sufficiently forest dependent, they will prefer to manage the land for non-forest purposes. If this seen as societally unacceptable (the fairness question), then society would have to figure out ways in which the incentives for managing the land as forests and

within that for managing it in ways that generate significant offsite benefits can be increased. That is, ways in which offsite benefits of forests can be 'internalised' by the local beneficiaries. From this emerges the argument for both increasing the local users' share in forest produce (e.g., granting them 50 percent share in returns from timber—an approach adopted under the Joint Forest Management programme)—and for setting up markets in which local forest users can 'sell' ecosystem services to offsite beneficiaries (an approach being advocated more recently under the acronym PES or "payments for ecosystem services.")

In the second approach, the idea is compare benefits to 'society at large' from different ways of managing the forest (and of setting up the forest boundary), which requires aggregation across all columns. This means first estimating the 'value' of several indirect, sometimes intangible and fuzzy services, and then aggregation across very different beneficiary groups, a risky proposition at best.[10] In this case, there is a much stronger prescriptive element, a position that societies *should* make decisions about forest conversion and management using such aggregate economic valuation. This aggregate economic valuation approach also underpins the Supreme Court's idea of imposing some large Net Present Value (NPV) charge when forest is converted to non-forest and the upstream states' demand for compensation from downstream states for ecosystem services provided (the last 4 columns in the matrix). There is no discussion here about whether the state (to whom the compensation goes in both cases) is an appropriate representative of local forest users who actually face the opportunity cost of not managing forest lands in their own interest, how the compensation will actually reach the local user, or whether such monetary compensation should be equivalent to the opportunity cost incurred or the benefits provided. This suggests that 'returns' and 'value' cannot be separated from the institutional context, a point that we will return to below.

Tangible Products: Declining Dependence or Under-Estimation?

The earlier discussions, up to and including the discussion on structuring JFM, focused on the direct benefits, i.e., tangible forest products that local communities derive from forests and other common lands. Since the publication of Jodha's pathbreaking empirical studies on the role and condition of Common Property Land Resources (CPLRs) in semi-arid India (Jodha 1986; Jodha 1990), a large number of studies have tried to assess the level of direct material 'dependence' that rural communities have forests and other common lands (Beck and Ghosh 2000; Chopra and Dasgupta 2008; Menon and Vadivelu 2006; Nadkarni *et al.* 1989; Narain *et al.* 2008, Gupta and many others; Reddy and Chakra-

varty 1999).[11] The common message of these studies was that collection of produce from CPLRs including forest lands contributed significantly to the imputed incomes of rural households, the contribution ranging from 10 to 40 percent depending largely on the agro-ecological context (with the contribution being greater in forested areas).[12]

At the same time, most of these studies also pointed out that there was a lot of variation in forest dependence across economic classes within the village. It was generally found that the relative contribution to imputed income was higher for poorer households, but the absolute value of produce collected from CPLRs may or may not vary much by class. Much depended upon the manner in which access to CPLRs is given—for instance, in the Western Ghats many portions of forested lands are (by law) under individual control of the richer or landed households. Much also depended upon the kinds of rights ceded in the CPLRs by the state and the complementarity between the produce harvested and the returns from agriculture (e.g. Nadkarni *et al.* 1989).

Nevertheless, the assumption of a generally high forest dependence in forested areas and the particularly high dependence of the poor has been the bedrock of the feasibility and also desirability argument for decentralised management. If the poor are more dependent on forests, then surely regenerating forests will be not only environmentally beneficial but also a pro-poor measure? And surely, these poor in particular and rural communities in general would participate enthusiastically in this regeneration and management?[13]

In recent years, however, some research is beginning to throw doubt on this easy assumption and inference. First, the way in which past studies have imputed economic value to forest products that are not marketed that might have led to overestimation.[14] Second, empirical evidence from decentralised management as actually implemented shows a limited increase in incomes in many places (Ravindranath *et al.* 2000).

Third, the dependence of local communities on forests and other common lands seems to be declining as a result of conventional development processes. The empirical evidence for such a decline is as yet sketchy, partly due to differences in methods. Jodha himself highlighted the decline in dependence from the 1950s to 1980s, although he emphasized the 'push' effect of declining CPLRs as the main reason. However, Kiran Kumar *et al.* (2008) compared dependence in a village with canal irrigation with a village without, and showed that CPLR dependence was much higher in the latter. Lélé (2001a) shows that in the Western Ghats of Karnataka, dependence on forests is much lower where large tracts of forests have been converted into coffee and other plantations. The NSSO 54th round data of 1998 show shifts away from public and common lands to dependence on resources from privately owned but ecologically open access lands [illegible]

one goes from less agriculturally developed regions to regions like Punjab and Haryana. Sarkar has pointed to the shift to LPG for cooking even in the heavily forest-dependent villages of the middle Himalaya (Sarkar 2008). Field observations indicate a lack of interest in managing common lands in the heavily developed agricultural tracts. The intuitive explanation for these observations is fairly straightforward. Conventional agricultural development includes the introduction of irrigation, fertilizers, high-yielding varieties, introduction of cross-breed cows and if possible mechanisation. This leads to intensification of cropping, increased availability of crop residue for grazing and/or fuel on the one hand and the reduction in the livestock population and especially in the livestock involved in open grazing. In extreme cases, mining or quarrying may give cash incomes that allow the purchase of products or services that were earlier collected or obtained from the forest. Menon and Lobo have highlighted a shift in labour to mining and quarrying, which destroys common lands but provides more lucrative wage opportunities (Menon and Lobo 2008).

In the words of economists, many forest products may be 'inferior goods'—goods that will get consumed when incomes are low (and so alternatives are unaffordable) but which are abandoned as soon as incomes rise. Certainly it appears that firewood, grazed biomass and perhaps even leaf manure are in that category today. Their collection is labour intensive and seen as giving low returns. In the absence of technologies that can simplify their use or increase their use efficiency, and in the presence of policies such as LPG subsidies, electricity subsidies, support for 'modern' animal husbandry and fertilizer subsidies, these traditional products are abandoned by the users at the first opportunity. As Byron and Arnold say, "activities based on low-value, labor-intensive forest products and processes will usually decline, while those based on higher-valued products in demand in the markets should increase (Byron and Arnold 1999)."

Fourth, related to the characteristic of high-volume but low-value goods such as firewood and other features of CPLRs, there is an emerging argument that while forests can function as safety nets and help in poverty avoidance or mitigation, they cannot form the basis for poverty elimination, i.e., for *lifting* people out of poverty "by functioning as a source of savings, investment, accumulation, asset building, and lasting [and substantial] increases in income and well-being" (Sunderlin *et al.* 2005). The markets for products that can be harvested in large quantities over large areas are limited while the high-value products may be generally scarce and patchy in their distribution. "If external constraints were removed, people would prefer other activities over NTFP collection" is the argument (Belcher *et al.* 2005).

A fifth argument has been with us for a while, that there is too much variation in both the type and extent of dependence across different goods within

most rural communities, and this 'heterogeneity' in dependence will increase divergence in objectives and increase the transaction costs of collective management. Paradoxically, while the the poor are more dependent than the rich, they also have much greater constraints on their time and may not be able to spare the time to get involved in day-to-day management. Most 'involvement' of the poor that is observed in JFM programmes so far has been for the sake of wage labour opportunities that the heavily-funded programmes have generated temporarily.

Finally, a sixth argument amplifies this heterogeneity effect, coupling it with questions of power. As long as forests are unproductive, collection involves hard labour and generates low-value goods, the elite in the village are happy to be non-dependent on the forest. But the moment forests regenerate, collection costs go down, and high-value goods are accessible (for instance by getting a right to timber), the elite declare themselves to be 'forest-dependent', having as much right to get involved in JFM committees as others, and in doing so, skim off the profits (the 'resource rent') leaving the forest-dependent labourers in the same situation as before. Several examples of this were documented in the joint forest management programme in Karnataka. In Uttara Kannada district of the Western Ghats, a VFC president declared that the marketing of *Garcinia gummi-gutta*, which had been hitherto handled individually by the NTFP collectors, must now happen through the VFC, and in the process he skimmed off all the profits. In two 'successful JFM' villages in the eastern plains of Karnataka, the village elite controlled the VFC and simply took a share in the royalties from auctioning the NTFP collection rights to outsiders, leaving the NTFP collectors in their own village in the same condition as before. In another even more applauded village, the forest department's approach of using older eucalyptus plantations has incentives resulted in the fuelwood headloading families having to leave the village (see Lélé *et al.* 2005 for details).

Is it then time to abandon the notion of local communities managing forests because of their dependence on forest produce? One may argue that the question is ill-posed because one could say that local communities have a right to manage forests that they are surrounded by, and the decision to give them the power to manage these forests should not be contingent on whether they are dependent or not. Nevertheless, it is likely they will not take on the task of forest management until they can see forests as drivers of development. And certainly statements like "communities can increase forest incomes five-fold by 2020 – from under Rs 200,000 each year to more than Rs 1 million for a typical community ... using existing technology and management and without compromising forest sustainability" (World Bank 2006) are naïve or simplistic. But to conclude that forests cannot be potential drivers of rural development might be premature, not so much because current numbers are right or wrong, but because, as Mogan

(1989) pointed out, valuation based on prices that obtain under the current distribution of property rights is akin to driving by looking into the rear-view mirror. Estimates of how much sustainable income forests can generate under decentralization cannot be based upon prices and conditions obtained under either pre-decentralization or faulty or incomplete decentralization. A re-examination of the evidence indicates several problems.

First, the evidence from the 1980s and early 1990s usually corresponds to situations where the CPLRs has been open-access and subject to degrading pressure for several decades, and therefore quite far from producing at its maximum. Second, and more important, even under JFM or other such policies,[15] the rights[16] to the economically most valuable forest products—timber, softwood, *tendu* leaf, bamboo—have never been clearly handed over to local communities. In most JFM situations, only open canopy forests or grazing lands were taken up for tree planting, thereby imposing heavy costs on graziers and firewood collectors, and these plantations have not matured yet, and in any case the entire process of determining when and what to harvest and then actually harvesting and selling it has been controlled and conducted by the forest departments at their own discretion (Sundar *et al.* 2001; Verma 2008). Even in the best case of West Bengal, the share in the final harvest of sal produce has not been transferred to the forest protection committees in many cases (Banerjee 2007). Rights transferred on paper are thus not translated into real incomes. Many ex-ante studies calculated that the returns from JFM would be substantial (e.g., Hill and Shields 1998), but their calculations have gone awry mainly because JFM never got implemented in the way they visualised.

The case of NTFPs is similar.[17] The most valuable NTFPs—*tendu* leaf, sal seed, *mahua* and bamboo—were supposedly 'nationalised' to protect the interests of the (mostly tribal) collectors, but in practice this protected the revenue interests of the states. Even the relatively radical NTFP policy introduced recently in Orissa leaves the most valuable produce (*tendu* leaf) outside its purview. Even in the case of products to which full rights were conceded, the institutional arrangements through which these rights could be exercised and incomes realized have been dismal failures. Cooperative societies supposedly set up to improve the prices that tribal collectors get ended up becoming grazing grounds for government officials (Lélé and Rao 1996). The movement towards reducing the margins retained by the state or its various agencies and intermediary corporations has been slow and haphazard.

The high potential for increased income from forest products can be seen from the rare cases where rights are unambiguously and substantially transferred and associated institutions have functioned to some extent. For instance, the So[illegible] of B R Hills of Karnataka had (until recently) exclusive NTFP harvesting

rights to large patches of forest, and these NTFPs have to be sold through their own co-operative societies called LAMPS. In one LAMPS, when the community could be mobilised and pressure brought upon its office-bearers to conduct auctions transparently and manage accounts honestly, the returns to Soliga NTFP collectors were typically 50 percent higher than when the society is malfunctioning—with no change in access conditions, technologies of processing, or market conditions (Lélé *et al.* 2004). Another example is the traditional individually controlled woodlots in coastal Karnataka, which are playing a 'banking' function while also providing inputs to agriculture (Srinidhi and Lélé 1999). A third larger-scale but more controversial example is of course of the timber rights that various villages, clans and individuals in the north-eastern states enjoyed until recently. While there was mixed evidence as to the long-term sustainability of the logging regimes followed, it is clear that the returns had been very substantial for quite some time (Nathan 2000). Instead of improving the regulation for sustainability and offsite impacts, the Supreme Court's 1996 decision to clamp down completely on logging has had serious livelihood impacts (Nongbri 2001) and subsequent relaxation through centrally approved working plans has not really addressed the core issues.

These cases of success as well as the failures cited above also highlight the almost inextricable link between economics and institutions that most economic analyses tend to ignore. Unambiguous transfer of rights to all products, transparent and hands-off setting of sustainability regulations (rather than micro-managing what villagers do on a day-to-day basis as JFM currently does), clear and statutorily protected tenure boundaries after an open and sensitive enquiry into pre-existing customary rights and needs, clear separation of the regulatory role of the forest department from its role as policing support and as technical support, separation of the regulatory functions from the profit-making functions of institutions within the community itself, and strictly supportive roles for the state in product marketing constitute some of the pre-conditions for an honest trial for produce-based forestry. The STOFDA 2006 is an important step in this direction in that it addresses some basic issues of tenure security and identification of forests that communities are willing to manage, but much more needs to be done (Joint Committee 2010).

Ecosystem Services: Goldrush or Pipedream?

In a workshop organised by the Indian Institute of Public Administration in 1997,[18] Madhav Gadgil, one of the doyens of people-oriented forest ecology in India, made a presentation in which he argued that we were entering a new era

in terms of the relationship between local communities and biodiversity conservation. Whereas in the past rural communities had conserved biodiversity for mostly cultural reasons, including notions of 'sacredness', the modern era had shifted to a more materialistic perspective, and therefore rural communities would conserve biodiversity only if it made economic sense for them to do so. On the basis of this proposition, and further assuming that economic returns to these communities from the direct use of biodiverse ecosystems around them would be insufficient, Gadgil argued for setting up a system of fiscal transfers to rural communities in proportion to the biodiversity they conserve. This proposal he had already made in an article in EPW in 1994 itself (Gadgil and Rao 1994). To the best of my knowledge, this constitutes the first proposal in India for what is now a major buzzword: PES.

While Gadgil proposed payments for biodiversity conservation, recent discussions have focused more on payments for watershed services and carbon sequestration. PES around carbon sequestration seems to be likely to materialise very soon in some countries, as mentioned earlier, and are being attempted on an experimental basis in India as well (e.g., Satyanarayana 2004). The advantage PES for carbon has over the other services is that, relatively speaking, the 'service delivered' is well-defined, physically easy to measure and has a huge market and a relatively clear price (with Western countries hoping to outsource their emission reductions). Many analysts are championing its cause, hoping that it will be the silver bullet to the problems of environmental conservation and rural development at the same time.[19]

But an institutional analysis of carbon-based PES shows significant weaknesses. First, while the increase in carbon storage from forest growth is a relatively well understood phenomenon, the signing, monitoring and enforcement of any contracts between offsite 'buyers' and local 'suppliers' will involve huge costs that might make the proposition unattractive in the end. Second, institutional economics tells us that the opportunity cost as measured through surveys of 'what people harvest and what market value it has today' often significantly lower than 'what people are willing to accept to give it up' (Vatn 2005). The reasons have to do with the institutional setting again. In the former case people are collecting produce largely on sufferance. In the latter case, they are given the right of refusal, in this case refusal to stop harvesting, which is a stronger rights regime.

Third, and most importantly, markets only work when property rights are well defined and secure. The major problem in the Indian forest sector has been *precisely* that (as discussed in the previous section) the rights of local communities have not been well-defined or secure. The failure of JFM has not been only due to its low income potential but also, as mentioned above, because it does not adequately address the core issue of forest rights and institutional arrangements. Fourth, as the matrix

in Table 1 shows, there is a serious ecological divergence between the permanent sequestration of carbon and the production and use of biomass for firewood, grazing, fodder, and manure. And as mentioned earlier, there are significant differences within local communities regarding dependence on these products, with the local elite much less dependent than the poor or the women. Even if the poor get compensated in cash for not touching the sequestered carbon, the question remains as to what will they use for fuel? Will they buy LPG with that cash, thereby nullifying the carbon benefits of forest-based sequestration? Much more likely in a highly stratified Indian rural community is the scenario where the elite coerce the poor to stop using firewood and corner much of the cash that comes to the village, thereby leaving the poor even worse off, as has precisely happened in JFM.

The case of watershed services is even more complicated, because the physical relationship between different types of forest management upstream and the range of 'watershed services' downstream is itself much more poorly understood than that between forest growth and carbon sequestration (see question marks in Table 1). Indeed, there is a major and as yet unresolved debate in the forest hydrology literature as to whether the presence of forests in the catchment increases or reduces water availability downstream.[20] Our attempt to understand this question indicated that the impact is very context-, technology- and institution-specific. In one case, upstream forest regeneration would reduce inflows into irrigation tanks immediately downstream of the catchment, reducing the probability of irrigated summer paddy cultivation significantly and therefore reduction in agricultural incomes and employment. This is contrary to the conventional wisdom of forests providing *positive* hydrological services to (all) downstream communities. Similarly, the flood control and siltation avoidance benefits that forests in the Himalayas were assumed to provide to people living in the Gangetic floodplains have now been questioned extensively (CSE 1992). Of course, specific cases such as of protection of forests in reservoir catchments benefiting water quality for Simla town water users (Vikram Dayal, personal communication) can certainly be identified, but generalisations are not possible.[21]

Second, unlike the case of carbon sequestration, where the beneficiaries are global and the actual 'buyers' are the higher-income countries who cannot be said to have had any historical right to pollute the atmosphere, the potential 'buyers' in the watershed services case are different. They are necessarily going to be based in South Asia, in downstream rural communities whose incomes may not be much higher than those of the potential recipients of the payments and/or who may argue that they have a historical right to the flows in the stream or river and cannot be now asked to pay for these flows. The problem with the PES approach is that it bypasses questions of what is the distribution of rights between upstream and downstream or local and offsite beneficiaries of a service,

and implicitly takes a position that 'those who are close to the forest are effectively the owners'. This may come as a refreshing anti-dote to the longstanding position that denies the forest rights of local communities altogether, but swinging the pendulum unthinkingly to the other extreme is unlikely to be societally acceptable or fair. Water rights are a historically complicated and controversial subject in India, and an ad-hoc approach to inserting PES for watershed services will only add to the mess.

The case of biodiversity conservation 'service' is even more complicated in some ways but perhaps amenable to some alternative approaches as well. The approach that Gadgil proposed involved payments that would come from the state, in return for the public good called biodiversity. The payments were supposed to be in proportion to the incremental amount of biodiversity conserved. But what is the economic value to wider society from biodiversity or wildlife conservation in a national park? This is not something that can really be estimated, the enormous attempts of environmental economists notwithstanding. One may argue that a fully market-based approach does not require us to know *a priori* what the value is: the value will emerge in the market. But as in all other cases, unless local communities have some reliable estimates or guarantees, they will not invest in the difficult and lengthy task of biodiversity conservation. And again, for prices to emerge in a market, property rights have to be well-defined. So do local communities 'own' the biodiversity in the forests around them? If so, can they destroy that diversity if the payments are not enough? Or the communities there on sufferance, and the payment is more like a token donation to a potential thief? What is to prevent them from taking the donation and then continuing to destroy wildlife (if that is what they wanted to do in the first place)? If this means that policing is still required, then how do we address the fact that policing has historically been of limited effectiveness in wildlife areas? That the Sariska forests were intact but the tigers were missing? All the monitoring issues that are already rampant in protected area management come to the fore here. Not surprisingly, there do not seem to be any real payment-based approaches to biodiversity conservation being tested in the field in India. What we have instead are 'compensation' or 'financial subsidy' type approaches that try in various ways to reduce the hardship of those displaced by protected areas, including the World Bank's so-called "Eco-development" project. None of these projects have made much headway, again partly because they do not manage to deliver even the limited compensation into the hands of the neediest, nor provide long-term improvements in livelihoods.

Interestingly, an alternative approach that focuses on the more tangible manifestation of wildlife and biodiversity is the granting of shares in revenues from tourism. In the case of Nepal, as with community forests, there is legislatively

mandated sharing of tourism revenues. While the results are far from perfect (see Straede and Helles 2000 for the case of Royal Chitwan National Park), it is truly puzzling why no attempts at revenue sharing have been made in India. Rather than removing and rehabilitating villagers from the protected area back into some agricultural context, why were the villagers not given the right to control and manage eco-tourism? Why is it that tourism is either managed by the state agencies or large businessmen and entrepreneurs from neighbouring towns, with local households simply providing wage labour in both cases? This goes back to the highly differentiated social context and the challenge that is poses to any institutional innovation. Without denying this challenge, one can argue that tourism is at least much more tangible an activity and a 'buyer' than receiving grants from an distant central government for outputs that cannot be measured.

CAMPA: Return to the Dark Ages

Over the past two and a half decades, while activists, academics and donors were analysing and debating different approaches to decentralised management of forests and more recently as the usefulness of PES as a way of adding to the economic stake of local communities, the Supreme Court and the forest bureaucracy have gone in a rather different direction. They have focused on the fiscal arrangements for forestry, and have come up with a series of measures that are mind-boggling in their scope but also their flimsy basis and blissful ignorance of the ongoing debates. The bureaucracy was always sceptical of JFM and wanted to revert to its simplistic, heavily-funded 'afforestation or tree planting' model of forestry. It therefore continued to draw up "National Forestry Action Plans" that are long on spending and short on community involvement and completely silent on tenurial issues. Subsequently, they have paid lip-service to community involvement by setting up Forest Development Agencies as supposedly federations of the JFM committees, through which funds will be channelled for tree planting.

In parallel, the Supreme Court in its wisdom decided to provide an economistic twist to it the Forest Conservation Act. When forest is converted to non-forest through the procedures laid down in this Act, the applicant was required to pay for 'compensatory afforestation'. The Court decided that this was inadequate and that the applicant must pay the 'full net present value (NPV)' of the forest. In the process, the Court did several things. First, it effectively pushed a governance decision (about the broad question of whether converting forests into non-forests in a particular location was societally acceptable) into more of an economic decision. It again did not recognise that forests have multiple stakeholders at different scales, that the local stakeholders have historically been given short shrift

while the loss of forests often hurts them the most, that the lack of clearly defined rights for different stakeholders and ways of democratically balancing between them has been the core problem of forestry in India, and specifically the inability of a local community to say no to forest conversion applications received from mining and industry was the bigger problem with the FCA, not the inadequate amount paid for compensatory afforestation.

Second, in laying down a tentative value of 5-9 lakh Rs/ha as the NPV that was supposedly derived from some study in Himachal Pradesh, it not only accepted the welfare economic paradigm mentioned in section 0 wherein 'values' can be measured by some external, objective agency, but also swallowed the deficient economics underpinning these studies and the flawed concept of "Total Economic Value." The notion of total economic value of forests floated by economists (I think initially as a pedagogic device) inadvertently suggests that the different values (direct use values, indirect use values, existence values) can be added up to get the total value. But as the matrix in Table 1 shows, the relationships between the values or benefits are not all complementary. When certain kinds of benefits increase, others often decrease. Unfortunately, the study referred to by the Court[22] have added up all values,[23] made strong assumptions about current use patterns being sustainable, used market prices to impute value of firewood and grazing in remote areas, and most problematic of all, used a completely erroneous value of Rs. 5.2 lakh/ha of forest cover as the annual value of watershed services, to end up with a total annual economic value of Rs.7.43 lakh/ha.[24]

Third, by asking that these payments be deposited into a central fund to be used only for afforestation, the Court strengthened the idea that the 'loss' that occurs existing model of forestry as a simple tree-planting oriented activity that just requires money to be thrown at it. While clearly there are areas which require investment in order to regenerate, it is also clear that unless they are coupled with robust local institutions that will plan, protect and use the regenerated forest in the long run, the investments will be little more than an employment programme and a source of corruption, like most other government schemes.

After setting a tentative figure of Rs. 5-9 lakh/ha, the Court did set up a committee headed by Kanchan Chopra to recommend better figures. The Chopra committee's report (Chopra *et al.* 2006) tried to make several improvements in the methodology. It made major improvements to the figures used, recommended changing the relative proportions of different benefits depending upon the type of forest, and further recommended that the NPV collected should be split into three funds (Central, state and local) to compensate losses to different levels of stakeholders. Unfortunately, the Court in its wisdom rejected at least two key recommendations—the variations by forest type and the need for a local fund. And the Court asked the central government to then put its orders into law, to which

the government has responded alacritously by drafting the CAMPA (Compensatory Afforestsation Fund Management and Planning Authority) bill that will further strengthen the conventional model of forestry. The 11th Finance Commission has endorsed the idea of transfer payments to states with higher forest areas, the funds for CAMPA (unspent amounts from the compensatory afforestation and NPV charges) have already crossed Rs.10,000 crores, and the government is hoping to scale this up to Rs.25,000 crores by linking up with EU carbon markets (Nitin Sethi, pers.comm.), and route all the money through the FDAs into a massive "GREEN INDIA" programme. After two and a half decades of pushing for decentralisation, of giving incentives to local communities, of trying to come to terms with the multiplicity of meanings of 'forest', it appears that we have now come a full circle.

Concluding Remarks

Debates on the economics of forestry in India have moved in different and sometimes disconnected ways. After decades of financial analysis of plantations and forest-based industries, the focus shifted in the 1990s to the question of tangible economic returns for communities participating in decentralised forest management programmes. When the programmes stagnated and the returns proved elusive, policy wonks proposed PES from carbon and watershed services as the panacea. In the meantime, with the Supreme Court getting involved in major decisions about forest management and conversion, we see a return to a more centralised and fiscal approach that is oblivious to the previous debates. The two debates are linked only by the mercenary use by the state of institutions set up in the decentralised forest management as simply channels to spend public funds on tree planting.

As long as the focus is simply on pouring money into tree pits and nurseries, one may as well forget the question of incentives and go home. At some point, however, the debate will come back to a more meaningful level: whether it is because forest rights committees set up under the STOFDA demand greater economic rights or whether donors try to link carbon funds with rural poverty alleviation objectives. At that point, the question of economic returns will return to the fore. When it does, I would argue that focusing on increasing incomes from tangible forest products might be more fruitful an approach than focusing on intangible and ambiguous ecosystem services and their 'markets'. I have also tried to demonstrate above both approaches have to any way confront the subtleties *within* the simple notions of "forests" and "forest-dependent communities" and also engage with the question of institutional arrangements that critically shape

the very realization and the distribution of benefits—whether from products or from services. Clarifying and re-distributing forest tenure without radical changes in the institutional arrangements will mean that national, economic incentives and investments will get misdirected and misappropriated.

At another level, the dilemma seems to be whether forest management should be thought of as a question of livelihood enhancement or enhancing net economic welfare, or one of environmental governance. Those subscribing to the former focus on market development, prices, costs, etc. Those subscribing to the latter focus on the distribution of rights between beneficiaries, the assignment of responsibilities and environmental and social conditionalities, etc. Perhaps the answer is that it is not either/or: it is the development of equitable and sustainable livelihoods within a wider setting of environmentally sound and fair governance, and an even wider belief in an environmentally and socially just society. Unless such visions take root and permeate our institutions, economic calculations and valuations will not translate into meaningful change on the ground—for ecologies or livelihoods.

References

Anonymous. 2005. *Just monetise it*. 14: 27-29.

Banerjee, A. 2007. Joint Forest Management in West Bengal. In: *Forests, People & Power: The Political Ecology of Reform in South Asia* (eds. Springate-Baginski, O. and P. Blaikie). Pp. 221-260. London: Earthscan.

Beck, T. and M. G. Ghosh. 2000. Common Property Resources and the Poor: Findings from West Bengal. *Economic and Political Weekly* 35: 147–53.

Belcher, B., M. Ruíz-Pérez and R. Achdiawan. 2005. Global patterns and trends in the use and management of commercial NTFPs: Implications for livelihoods and conservation. *World Development* 33 (9): 1435-1452.

Bonell, M. J. and L. A. Bruijnzeel. 2004. *Forests, Water and People in the Humid Tropics: Past, Present and Future Hydrological Research for Integrated Land and Water Management*. Cambridge: Cambridge University Press.

Byron, N. and M. Arnold. 1999. What futures for the people of the tropical forests? *World Development* 27 (5): 789-805.

Chopra, K. and P. Dasgupta. 2008. Nature of household dependence on common pool resources: An empirical study. *Economic and Political Weekly* 43 (8): 58-66.

Chopra, K., G. K. Kadekodi and V. B. Eswaran. 2006. *Report Of The Expert Committee on Net Present Value*. Supreme Court of India, New Delhi.

CSE. 1992. *Floods, Flood Plains and Environmental Myths. State of India's Environment: Part Citizen's Report*. New Delhi. Centre for Science and Environment.

Fisher, A. C. 1981. *Resource and Environmental Economics*. London: Cambridge University Press.

Gadgil, M. and P. R. S. Rao. 1994. A system of positive incentives to conserve biodiversity. *Economic and Political Weekly* 29 (32): 2103-2107.

Godoy, R., R. Lubowski and A. Markandya. 1993. A Method For the Economic Valuation of Non-Timber Tropical Forest Products. *Economic Botany* 47 (3): 220-233.

Hill, I. and D. Shields. 1998. *Incentives for Joint Forest Management in India*. The World Bank, Washington, D.C.

Jodha, N. S. 1986. Common property resources and rural poor in dry regions of India. *Economic and Political Weekly* 21 (27): 1169-1181.

Jodha, N. S. 1990. Rural common property resources: Contributions and crisis. *Economic and Political Weekly* 25 (26): A65-A78.

Joint Committee. 2010. Manthan: *Report of the National Committee on Forest Rights Act* Ministry of Environment and Forests and Ministry of Tribal Affairs, Government of India, New Delhi.

Kiran Kumar, A. K., S. Lele and P. Shivashankar. 2008. Impact of irrigation-led agricultural development on use of common lands in dry regions of Karnataka, India. In: *Insights from the Field: Studies in Participatory Forest Management in India* (ed. Anonymous). Pp. 110-134. New Delhi: RUPFOR, Winrock International India.

Kohli, K. 2008. *Institutionalising compensation for lost forests*.

Krishnaswamy, J., S. Lélé and R. Jayakumar. Hydrology and Watershed Services in the Western Ghats of India. In. P. xii+299. New Delhi: Tata McGraw-Hill.

Lélé, S. 2001a. *Linking Ecology, Economics, and Institutions of Village-level Forest Use in the Karnataka Western Ghats*. Institute for Social & Economic Change and Pacific Institute for Studies in Development, Environment & Security, Bangalore.

Lélé, S. 1994. Sustainable use of biomass resources: A note on definitions, criteria, and practical applications. *Energy for Sustainable Development* 1 (4): 42-46.

Lélé, S. 2001b. *What is wrong with JFPM?* In: State-level Convention on Campaign for Participatory Forest Management. Organised by Jana Aranya Vedike at Bangalore. 4-5 December 2001.

Lélé, S., K. S. Bawa and C. M. Gowda. 2004. *Ex-Post evaluation of the impact of an Enterprise-Based Conservation project in BRT Wildlife Sanctuary, India*. In: The Commons in an Age of Global Transition: Challenges, Risks and Opportunities, 8th Biennial Conference of the International Association for the Study of Common Property. Organised at Oaxaca, Mexico. 9-13 August.

Lélé, S., A. K. Kiran Kumar and P. Shivashankar. 2005. *Joint Forest Planning and Management in the Eastern Plains Region of Karnataka: A Rapid Assessment*. Centre for Interdisciplinary Studies in Environment and Development, Bangalore.

Lélé, S., M. Pattanaik and N. D. Rai. 2010. NTFPs in India: Rhetoric and reality. In: *Wild Product Governance: Finding Policies that Work for Non-Timber Forest Products* (eds. Laird, S. A., R. McLain and R. P. Wynberg). Pp. 85-112. London: Earthscan.

Lélé, S. and R. J. Rao. 1996. Whose Cooperatives and Whose Produce? The Case of LAMPS in Karnataka. In: *Rediscovering Cooperation* (ed. Rajagopalan, R.). II. Pp. 53-91. Anand, Gujarat: Institute of Rural Management Anand.

Lélé, S. and A. S. Srinidhi. 1998. *Indian Forest Policy, Forest Law, and Forest Rights Settlement: A serious mismatch*. In: International Workshop on Capacity Building in Environmental Governance for Sustainable Development. Organised by Indira Gandhi Institute for Development Research at Mumbai. Dec.8-10.

Lélé, S., V. Srinivasan and K. S. Bawa. 2001. Returns to investment in conservation: Disaggregated benefit-cost analysis of the creation of a Wildlife Sanctuary. In: *Proceedings of the International Conference on Tropical Ecosystems: Structure, Diversity and Human Welfare* (eds. Ganeshaiah, K. N., R. U. Shaanker and K. S. Bawa). Pp. 31-33. New Delhi: Oxford-IBH Publishing Co.

Lélé, S., J. Vaidyanathan, S. Hegde, B. Venkatesh and J. Krishnaswamy. 2007. *Influence of forest cover change on watershed functions in the Western Ghats: A coarse-scale analysis*. Centre for Interdisciplinary Studies in Environment and Development, Bangalore.

Lise, W. 2000. Factors influencing people's participation in forest management in India. *Ecological Economics* 34 (3): 379-392.

Menon, A. and V. Lobo. 2008. *The Changing Face of the Commons*. In: National Workshop on "Beyond JFM: Rethinking the Forest Question in India." Organised by Centre for Interdisciplinary Studies in Environment and Development and Winrock International India at New Delhi. Sep 29-30.

Menon, A. and A. Vadivelu. 2006. Common Property Resources in Different Agro-climatic Landscapes in India. *Conservation and Society* 4 (1): 132-154.

Nadkarni, M. V., S. A. Pasha and L. S. Prabhakar. 1989. *The Political Economy of Forest Use and Management*. New Delhi: Sage Publications.

Narain, U., S. Gupta and K. van 't Veld. 2008. Poverty and resource dependence in rural India. *Ecological Economics* 66 (1): 161-176.

Nathan, D. 2000. Timber in Meghalaya. *Economic and Political Weekly* 25 (4): 182-186.

Nongbri, T. 2001. Timber Ban in North-East India: Effects on Livelihood and Gender. *Economic and Political Weekly* 36 (21): 1893-1900.

Norgaard, R. B. 1989. Three dilemmas of environmental accounting. *Ecological Economics* 1 (4): 303-314.

Ravindranath, N. H., K. S. Murali and K. C. Malhotra. Joint Forest Management and Community Forestry in India: An Ecological and Institutional Assessment. In. New Delhi: Oxford & IBH.

RCDC. 2006. *Policies governing NTFP: Orissa.* http://www.banajata.org/l/a25.htm. Accessed on February.

Reddy, S. R. C. and S. P. Chakravarty. 1999. Forest dependence and income distirbution in a subsistence economy: Evidence from India. *World Development* 27 (7): 1141-1149.

Sarkar, R. 2008. Decentralised Forest Governance in Central Himalayas: A Re-evaluation of Outcomes. *Economic and Political Weekly* 43 (18): 54-63.

Satyanarayana, M. 2004. How forest producers and rural farmers can benefit from the Clean Development Mechanism. In: *Proceedings of the Workshop on Forests for Poverty Reduction: Opportunities with Clean Development Mechanism, Environmental Services and Biodiversity held at Seoul, Korea on 27-29 August 2003* (eds. Sim, H. C., S. Appanah and Y. C. Youn). Bangkok: Food And Agriculture Organization of the United Nations, Regional Office for Asia and the Pacific.

Srinidhi, A. S. and S. Lélé. 1999. *Factors influencing sustainable forest management under regulated private property: The case of the haadis of Dakshina Kannada.* In: First INSEE Biennial Conference. Organised by Indian Society for Ecological Economics at Bangalore. December 20-22.

Straede, S. and F. Helles. 2000. Park-people conflict resolution in Royal Chitwan National Park, Nepal: buying time at high cost? *Environmental Conservation* 27 (4): 368-381.

Sundar, N., R. Jeffery and N. Thin. 2001. *Branching out: Joint Forest Management in India.* New Delhi: Oxford University Press.

Sunderlin, W. D., A. Angelsen, B. Belcher, P. Burgers, R. Nasi, L. Santoso and S. Wunder. 2005. Livelihoods, forests, and conservation in developing countries: An Overview. *World Development* 33 (9): 1383-1402.

Vatn, A. 2005. *Institutions and the Environment.* London: Edward Elgar.

Verma, D. P. S. 2008. Policy, legal issues and property rights in JFM. In: *Joint Forest Management in India* (eds. Bhattacharya, P., A. K. Kandya and K. N. Krishna Kumar). 1. Pp. 120-127. Jaipur: Aavishkar Publishers Distributors.

Verma, M. 2000. *Economic Valuation of Forests of Himachal Pradesh.* International Institute for Environment and Development and Himachal Pradesh Forest Department, London.

World Bank. 2006. *India: Unlocking Opportunities for Forest-Dependent People in India: Main Report: Volume I.* Agriculture and Rural Development Sector Unit, South Asia Region, The World Bank. New Delhi.

Endnotes

1. By 'forests as forests', I mean a range of land management options that stop short of intensive cultivation, that are sustainable in the sense of being long-lasting, and that provide some minimum offsite environmental services (see the next section).
2. Interestingly, much of these plantation areas continue to be clubbed under 'forest cover' in the Forest Survey of India's State of Forest reports.
3. I stick to a more conventional economic separation of products and services, avoiding the nomenclature of the Millennium Ecosystem Assessment wherein all benefits are termed as ecosystem "services."
4. Where social distance refers to the degree of access or lack of it, in spite of physical proximity.
5. What fraction of the 'final' price is actually captured by the rights-holder is always a complicated question depending upon the nature of the market, the product, the entrepreneurial skills of the rights-holders, and so on.
6. Because tourism is a 'toll' good, to use a term from public economics (Fisher 1981).
7. The signs in the table are only indicative and the question marks highlight areas of ambiguity, which we will discuss in the following sections.
8. This is not to say that ensuring sustainability of a particular forest management regime (row in the matrix), say a timber plantation, is a trivial task. But much of the battle over management appears to be about whether the objective should be timber (as the forest department may want) or grazing (that a local community may want) and therefore over the choice of landuse itself.
9. Typically, in decentralised forest management initiatives, local communities are not given the right to change the landuse, but if the opportunity cost is too high, this may result in very high pressures for encroachment, or loss of interest, undermining the community management setup.
10. This is not to say that the micro-economic approach involves no aggregation. In theory, micro-economics treats each individual or household as separate and seeks to characterise their individual assessments or behaviour. In practice, it often ends up making statements about differences across reasonably discernible groups: landless versus landed, men versus women, pastoral versus farming households, and so on. But I would argue that this level of aggregation is inevitable in any approach, economics or otherwise. On the other hand, aggregating across very different and distant beneficiaries involves a qualitatively different aggregation.
11. The National Sample Survey Organization even devoted its 54th round to assessing the role of CPLRs.
12. The only result which is at variance with the claim of 'generally significant [illegible]' (by ≥10 percent) is the large-sample NSS study, which pre-

the contribution of CPLRs at only 3 percent. Menon and Vadivelu (2006) point out that the NSSO data do not include the contribution of grazing (as against fodder collection). But this may not add more than 1 per cent point or so, leaving the large gap until 10 percent unexplained.

13. For instance, Lise (2000, factors influencing) shows that participation in JFM is higher in families that are more forest dependent.
14. Many studies simply use market prices of the forest product as the marginal value of the product to the collecting household. This method overestimates the value in two ways. First, it ignores the opportunity cost of labour for harvesting and transport to the market, which may be low in rural areas but not zero (Godoy *et al.* 1993). Second, it assumes that the household would have purchased the product from the market at that price, which is often not the case.
15. Such as the socalled 'tribal-oriented' NTFP policies of the last several decades or even the more radical recent Orissa NTFP policy (RCDC 2006).
16. Note that we mean harvesting rights along with conditionalities such as sustainable management.
17. See Lélé *et al.* (2010) for details.
18. "UNESCO Regional Workshop on Community-based Conservation: Policy and Practice," held on February 9-11, 1997, New Delhi
19. Our calculations in the case of B.R.Hills (Lélé *et al.* 2001) also indicated that the magnitude of climate change mitigation benefits, if valued at the price in carbon markets, would swamp the opportunity cost of grazing, firewood and NTFPs. But this analysis did not factor in the transaction costs of actually making the transfer payments, because it was more focused on identifying the benefit-cost distribution per se.
20. See Bonell and Bruijnzeel (2004) and also Krishnaswamy *et al.* (2006).
21. Also, the costs of measuring actually what additional hydrological service was received when upstream vegetation was regenerated are as yet quite high. Right now, downstream users do not even have basic data on flows in their streams and rivers, as these data are either not collected, or collected and not analysed and not shared with the public (Lélé *et al.* 2007).
22. The main source of the Court's figures appears to have been a study on the Himachal Pradesh Forest sector commissioned by IIED (Verma 2000).
23. For instance, the study assumes that the standing stock of the forest is increasing when calculating carbon sequestration, but also assumes that a large amount is harvested and used as firewood and timber.
24. Note that this is an annual value, for which the NPV, at a discount rate of 5 percent, would amount to much more. It is not clear how the Court arrived at 5-9 lakhs as the NPV—it may be that the Court did not distinguish between per year and discounted NPV.