Discussion Papers in Economics

# Collective Action for Forest Conservation: Does Heterogeneity Matter?

E. Somanathan R. Prabhakar Bhupendra Singh Mehta

**May 2002**

**Discussion Paper 02-01**

Indian Statistical Institute, Delhi
Planning Unit
7 S.J.S. Sansanwal Marg, New Delhi 110 016, India

# Collective Action for Forest Conservation: Does Heterogeneity Matter? [1]

**E. Somanathan[2] R. Prabhakar[3] Bhupendra Singh Mehta[4]**

*May 2002.*

*Abstract*

Community management of forests by Van Panchayats (forest councils) to meet local needs has a long history in the Indian Central Himalayas. This essay examines the effects of village-level heterogeneity in caste and land ownership, and of female membership in the Panchayats on collective action for forest conservation. There is no evidence that caste heterogeneity or female membership of the Panchayat have any effect. There is some evidence that greater equality in land ownership may enhance collective action and forest conservation in pine forests but not broadleaved forests. This is puzzling since villagers' interest in conservation is greater in broadleaved than in pine forests.

JEL Codes: O13, Q2

---

1This paper is part of a larger research project for which financial support from the National Science Foundation (USA) under grants SBR-9711286 and SES-9996602 is gratefully acknowledged as is field support from the UP Academy of Administration, and the UP Forest Dept. Much of the research was carried out at the Institute of Rural Management, Anand. We are very grateful to Preeti Rao, Sweta Patel, and Mohit Chaturvedi for excellent research assistance. James Boyce, Shanta Devarajan, Dilip Mookherjee, and seminar participants provided useful comments on earlier versions.
2Indian Statistical Institute, Delhi. E-mail: som@isid.ac.in
3Strand Genomics. E-mail: prabha@strandgenomics.com
4Foundation for Ecological Security. E-mail: bsmehta@irm.ernet.in

## Introduction

It is of interest to examine the role of heterogeneity in asset ownership and ethnicity in the success of community management of forests for at least two reasons. First, we would like to know under what conditions community management of forests (as compared to state management, for example), is likely to be successful in order to make policy appropriately. Secondly, this setting is interesting for examining some hypotheses about the role that heterogeneity plays in collective action in general.

There are at least three different arguments that can be advanced for why heterogeneity may be inimical to the success of collective action. One, proposed by Alesina, Baqir, and Easterly (1999), suggests that tastes for public goods may differ across groups, and this can reduce the willingness to pay for public goods which may not be the kind that one's own group wants. This argument does not really apply in the case of the Himalayan forests examined in this paper, where the benefit from collective action is forest preservation and its associated benefits so that there is really not much choice as to the type of public good to be financed.

A second argument, often made by political scientists, is that social divisions may throw up politicians who seek to provide private benefits to particular groups rather than providing public goods. Again, in the setting of small village forests, this argument does not apply.

This leaves a third argument, perhaps the simplest, which says that heterogeneity makes it harder for communities to reach an agreement about the sharing of benefits or costs of collective action. Inequality in power, for example, may mean that equal division would be unacceptable to the powerful, while any other distribution may be subject to conflict. The basis of this argument is that heterogeneity removes a natural focal point for agreements, and, simultaneously makes groups uncertain about other groups' preferences, thus making agreement less likely as each group tries to drive a hard bargain, one that may be unacceptable to the other groups. The community forest setting provides an opportunity to test this last argument.

This paper uses satellite data to measure forest density in Himalayan forests in northern India. The forests are managed by Van Panchayats, village councils created specifically to manage village forests. A village-level survey that was carried out as part of the research provides data on heterogeneity and other variables of interest.

## The Setting

The study area lies in the Himalayas, in the Kumaun and Garhwal regions in the state of Uttaranchal in northern India. It ranges from 300 to over 3000 meters in altitude. Terraced agriculture, the principal occupation, absorbing 80% of the labor force, is found up to a height of about 1800 meters on the gentler slopes. Owing to the mountainous terrain and the limited possibilities for irrigation, agriculture is far less productive than in the plains. The value of agricultural production per hectare in the three districts into which the study area falls is little more than a half that for India.

Forests are very important for agriculture, since they are the main source of manure. This comes directly as leaf mould from broadleaved, mainly oak, forests. The oak forests also indirectly support agriculture, being a source of fodder and grazing for cattle, whose dung is used for manure. Oak leaf fodder, in particular, is of importance since it is often the only source of green fodder in the winter months. (Himalayan oaks are evergreen, not deciduous). Timber from oaks has traditionally been used for making ploughs.

In addition to the broadleaved forests, from elevations of 1000 to 1800 meters there are *chir* pine (*Pinus roxburghii*) forests. The villagers generally perceive these to be less useful since they are not believed to be as effective in preserving the water supply, and are useless for fodder, while pine needles are an inferior source of manure. Pine trees provide firewood, but their greatest use, for timber, is bound up in cumbersome regulation by the government, even in village Panchayat (council) forests.

Despite the importance of the forests, widespread degradation has taken place, owing to the problem of the commons. Up until about the 1960's, oak forests were sometimes felled for making charcoal to be supplied to the hill towns and military bases. Following felling, grazing and lopping of the new growth by villagers often prevented effective regeneration and led to degradation into scrub.

The institution that forms the principal locus of collective action to manage village forests is the Van Panchayat, literally, "forest council". About one-third of the villages in the region have Panchayat Forests. The rest use Reserved Forests, which are managed by the state government's forest department, and Civil forests, which are unmanaged village commons. Civil forests are generally very degraded (Somanathan, Prabhakar, and Mehta, 2002).

The government established the Van Panchayat system in 1930 as a means of arresting the degradation that was then taking place. It was meant to enable the villagers to form officially recognized councils with the powers to frame rules for use of the forests under their control. These were to be known as Panchayat forests. Villagers could apply to create Panchayat forests out of Reserved forests and those parts of their village forests that had not been reserved.

Panchayat or Council members, are elected by a show of hands in front of a government official once every five years.[5] There are usually 5 to 7 members of the Panchayat, whose chairman is called the Sarpanch. The Panchayat is empowered to make rules and regulations to restrict and manage harvesting for forest products, and to levy fines on violators. Nevertheless, it lacks the coercive authority of the state, in that if the accused refuses to pay the fine, the Panchayat's only legal recourse is to approach the courts to recover the fine, a very costly procedure that is never resorted to. Instead, social pressure is applied to force the violator to pay. Another weakness of the system is that some Panchayats have no source of revenue other than voluntary contributions from villagers to pay for a watchman. Others may have revenue from the sale of contracts for resin-tapping from pine trees or leases for stone quarries on Panchayat land. However, the Panchayats often have difficulty in getting access to the funds from the proceeds of such activities, as their bank accounts are in the control of a state government official. These weaknesses imply that the Panchayats are strongly dependent on informal collective action and social norms.

Van Panchayats provide a favorable mechanism for overcoming the common pool problem in village forests, at least with respect to broadleaved species. The institution is the only one of its kind in India, in having permanent control over its forest, with legal recognition from the government. Villagers are far more secure in their tenure in comparison with the system of Joint Forest Management between the state forest departments and forest user groups which has spread widely in India in the 1990's. In fact, Van Panchayats probably compare favorably in terms of security of tenure and community control to most such institutions in developing countries.

---

5On the functioning of Forest Panchayats, see Anon. (1984), Saxena (1987, 1995), Ballabh and Katar Singh (1988), Somanathan (1991), Aggarwal (1996), Agrawal and Yadama (1997), Raju (1997), and Satyajit Singh (1998), among others.

While agricultural productivity is low in the region, inequality is lower than in the rest of India.[6] The gini coefficient of landholdings (including landless agricultural households) is only about 0.3 for Almora and Pithoragarh districts into which most of our villages fall and is about 0.43 for Chamoli in which the remaining villages fall. By comparison the gini coefficient for India is about 0.65 and is about 0.57 for Uttar Pradesh, the neighbouring state in the plains. Wealth inequality is still lower than these numbers suggest, of course, since agriculture is less productive in the hills. The low inequality is reflected in the fact that there are very few landless households in hill villages, and in higher rural literacy rates which in 1991 were above 45% as opposed to about 36% for India and 30% for Uttar Pradesh.

Caste heterogeneity is also lower than in the rest of India, with the index of caste heterogeneity at about 0.67 for the three hill districts being considerably lower than the mean for India or Uttar Pradesh, which are about 0.86. (These numbers are higher at the district than the village level, due to the definition of the index. See Tables 1 and 2.) The largest castes are Brahmins and Thakurs or Kshatriyas as they are sometimes called, with Scheduled Castes being a minority. Most villages have no other castes.

**Estimation and Results**

The effects of heterogeneity of a village in landholding and caste composition on collective action can be evaluated using different indicators of collective action. Some of these are direct measures of collective action, such as the hiring of watchmen or the annual frequency of meetings of the Panchayat. However, the efficacy of collective action ultimately depends on the net benefits from the forest.

These are of two kinds: benefits from the stock, and benefits from harvest flows. The most important direct benefit from the stock is water conservation. The forest reduces runoff during the monsoon and enables percolation of rainwater into the rock, essential for maintaining flows in springs. Water shortages are acute in many villages in the region, so the villagers see this as an important issue.

We have no data on benefits from harvest flows, but we believe that these are increasing in the stock, which we measure. There are two reasons to believe that villagers prefer to maintain

[6] Based on agricultural statistics from various states. Data sources for this and the following paragraph are derived from the 1931 and 1991 censuses and were provided by Rohini Somanathan.

high stocks if they can achieve the necessary collective action. First, privately owned trees and groves tend to be well-maintained and lopped for fodder and wood on a sustainable basis. If villagers were liquidity constrained and had high discount rates that rendered it optimal for them to disinvest in the forest stock, this would not be observed. Second, interviews with villagers in the course of fieldwork confirm that villagers see "successful" panchayats as being those with higher forest density.

**Data**

The data on village-level variables were obtained from village surveys conducted in 1998 and 1999. Information on the caste composition of households, the maximum and minimum landholding, the numbers of households with various amenities such as cooking gas and kerosene stoves were obtained along with some information on other village-level variables and information about the functioning of the Van Panchayat, if any.

The sample villages were selected by a random choice of thirteen 1:25000 topographic maps from those available in the districts with significant numbers of Van Panchayats. The first 10 of these that contained villages were selected and one was dropped owing to lack of time to survey it. Each valley (as we will refer to the areas from the maps) contains about 10-15 villages that were surveyed. In each village the Sarpanch or one of the other panches were surveyed. The information was checked by interviewing one or two other residents.

The data on the density of forest cover in each plot of land is derived from satellite images. Since the quality of these images for earlier periods is poor, it was feasible to obtain reliable data on a large scale only for a recent year, 1998.

Other important variables, constructed from maps and census data include: the mean distance of the Panchayat forest from the nearest habitation, local population density, and availability of other forest nearby that serves as a substitute, and ecological variables such as the mean aspect, altitude, and slope.

The data are examined separately for broadleaved and pine forests. The measure of the stock that is used is the estimated proportion of the area covered by tree crowns. For the species in question, crown cover is known to be highly correlated with other measures of the forest stock such as bole biomass, total above-ground biomass, and basal cover (Tiwari and Singh, 1984, 1987).

Crown cover is obtained from interpretation of an IRS-1D LISS-3 image from May 31 1998, covering an area of about 20,000 square kilometers. Details of the image interpretation procedures are given in Prabhakar, Somanathan, and Mehta (2001), so only a brief account is provided here. Information collected on the ground was used as an input to classify the image into broadleaved forest (including scrub), pine forest, and other categories (mainly grasslands and agriculture). Crown cover was visually measured in a sample of plots using a grid placed over an April 24, 2000, 1-meter resolution Ikonos satellite image. The IRS-1D Liss-3 image was used to compute various band ratios and the normalized difference vegetation index (NDVI). Regression of these measures on a logistic transform of crown cover in the sample revealed that the NDVI and the ratio of bands 2 to 5 were most closely correlated with crown cover in broadleaved and pine forests respectively. So the NDVI and the band ratio 2/5 were used to predict crown cover in our data.

Tables 1 and 2 describe the data.

**Table 1**: **Variable definitions and units**

| Variable | Definition |
|---|---|
| | |
| Area | Area in hectares |
| CCbl | Mean proportion of area covered by tree crowns in Broadleaved part of forest (1998) |
| Ccpine | Mean proportion of area covered by tree crowns in pine part of forest (1998) |
| Propbl | Proportion of forest that is broadleaved forest or scrub (1998) |
| Proppine | Proportion of forest that is pine forest (1998) |
| Aspect | Proportion of area that is north-facing |
| Altitude | Altitude in kilometers |
| Altsq | Square of altitude |
| Popdensity | Population density, persons/sq km. |
| Roaddist | Round-trip time in hours from nearest road |
| Nbl | Area covered by broadleaved tree crowns in polygons with centroids within 4 hour round trip time of polygon centroid[7] |
| Npi | Area covered by pine tree crowns in polygons with centroids within 4 hour round trip time of centroid |

[7] Data for forest cover and other geographic variables were obtained for polygons, with the union of one or more polygons comprising a Panchayat forest, Reserved Forest compartment, etc.

| | |
|---|---|
| sh_lpg | Share of households with LPG (cooking gas) in village |
| sh_kero | Share of households using kerosene in village |
| land_equal | Ratio of minimum to maximum landholding in village |
| caste_heter | 1 - (sum of squares of shares of households of each caste) |
| tot_hh | Total number of households in village |
| sh_wopanch | Share of women in the Van Panchayat |
| Watch | Dummy for watchman in Van Panchayat forest |
| bank_bal | Van Panchayat's bank balance in rupees |
| Panch_meet | Number of Van Panchayat meetings per year |
| Fine | Dummy for whether Van Panchayat levies fines |
| open_day | Number of days Panchayat forest is open in a year for any use |
| tot_lstock | Total livestock in village |

**Table 2: Summary Statistics**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Area | 65 | 187.6492 | 518.2693 | 1.5586 | 3977.997 |
| Propbl | 65 | .6563196 | .2459338 | .0364924 | 1 |
| Proppine | 64 | .2629923 | .2717436 | 0 | .9633344 |
| CCbl | 65 | .5519873 | .2911366 | .0497542 | .9901401 |
| CCpine | 60 | .3524733 | .3071703 | .0055805 | .9991623 |
| Aspect | 65 | .4758215 | .3471274 | 0 | 1 |
| Altitude | 65 | 1.578867 | .3754071 | .8209676 | 2.641732 |
| Altsq | 65 | 2.639199 | 1.273442 | .6739878 | 6.978746 |
| habdist | 65 | .8272339 | .4380927 | .2492761 | 2.416653 |
| Popdensity | 65 | 190.6974 | 142.9035 | 15.21957 | 807.4767 |
| Roaddist | 65 | 1.729002 | 1.7786 | .0936674 | 6.823395 |
| Nbl | 65 | 471.772 | 363.8833 | 1.256366 | 1551.407 |
| Npi | 65 | 112.5675 | 119.8815 | 0 | 376.6362 |

| | | | | | | |
|---|---|---|---|---|---|---|
| sh_lpg | \| | 62 | .1034808 | .1805171 | 0 | 1 |
| sh_kero | \| | 62 | .2182615 | .2419309 | 0 | 1 |
| land_equal | \| | 63 | .1272421 | .1294285 | 0 | .9090909 |
| caste_heter | \| | 53 | .3496799 | .2385456 | 0 | .7443225 |
| tot_hh | \| | 63 | 86.31746 | 73.484 | 7 | 286 |
| sh_wopanch | \| | 45 | .1844295 | .2191394 | 0 | 1 |
| Watch | \| | 47 | .7021277 | .4622673 | 0 | 1 |
| bank_bal | \| | 48 | 8756.604 | 31934.12 | 0 | 206090 |
| Panch_meet | \| | 46 | 5.630435 | 3.548763 | 0 | 12 |
| fine | \| | 45 | .4444444 | .5025189 | 0 | 1 |
| open_day | \| | 42 | 282.2143 | 92.18818 | 182 | 365 |
| tot_lstock | \| | 50 | 682.34 | 794.6712 | 60 | 3500 |

The effects of inequality and caste heterogeneity on collective action are presented in regressions reported in Table 3. The first column reports marginal effects evaluated at the means from a logit regression of the watchman dummy variable. Neither land equality nor caste heterogeneity has an effect on the probability of hiring a watchman that is statistically significant at the 10% level. Nor is there any measurable gender effect captured by the variable "sh_wopanch" which is the share of women in the panchayat. The regression reported does not include several potential controls. Any variable which affects the value of the forest could affect the choice of whether or not to hire a watchman. Such variables include ecological variables such as the proportion of the forest that is broadleaved, the aspect, as well as variables which affect the demand for forest products and the cost of harvesting. Inclusion of these controls, however, does not affect the result.

The second column reports a linear regression of the log of the annual frequency of panchayat meetings in the year preceding the survey on the variables of interest with the same controls. A 10-percentage point increase in land equality raises the frequency of panchayat meetings by 16 percent. This effect is statistically significant at the 10% level. Caste heterogeneity has a positive and insignificant effect. The inclusion of the controls listed in Table 1 does not weaken the result, with the coefficient increasing to 2 although significant only at the 12% level. However, the land equality coefficient, though positive, is not significant in regressions with valley dummies. It could be that this is simply on account of reduced variance in the explanatory variables together with an increase in the effects of measurement error.

**Table 3: Effects of Heterogeneity on Collective Action**

| | Watchman | Log(Panch_meet) | CCbl | Ccpine |
|---|---|---|---|---|
| Land_equal | 0.20<br>(0.53) | 1.6667*<br>(0.8655) | -0.127<br>(0.246) | 0.5786189*<br>(0.3287293) |
| Caste_heter | 0.43<br>(0.54) | 0.8893<br>(1.046) | -0.0491123<br>(0.1850669) | 0.0329509<br>(0.2401794) |
| Sh_wopanch | 0.04<br>(0.30) | -0.54<br>(0.59) | | |
| Aspect | | | 0.2311953**<br>(0.1031657) | |
| Log(tot_hh) | 0.2297**<br>(0.11597) | 0.4742<br>(0.2825) | 0.0426438<br>(0.0470941) | -0.0095995<br>(0.0656419) |
| Sh_Ha | -0.58<br>(0.54) | -1.03<br>(1.23) | -0.0208291<br>(0.2006364) | -0.1260322<br>(0.1597859) |
| Nbl | | | 0.0001476<br>(0.0001091) | |
| Constant | | -0.80<br>(1.29) | | 0.2787736<br>(0.2563678) |
| Wald chisq (5) | 11.38** | | | |
| F(5,38) | | 2.42* | | |
| $R^2$ | | 0.26 | 0.16 | 0.09 |
| Observations | 44 | 44 | 53 | 48 |

**Note**: One, two, and three *'s indicate significance at the 10%, 5%, and 1% levels respectively.

The results on direct indicators of collective action are mixed, with no effect of caste heterogeneity on either the frequency of meetings or the presence of a watchman, while there is some evidence that land equality affects the former positively, but not the latter.

Turning to the effects on outcomes, we consider broadleaved forests first. The third column of Table 3 reports a linear regression of crown cover in broadleaved parts of Panchayat forests with valley fixed effects and instruments for the neighboring stock of forests. These instruments are the predicted stock of broadleaved and pine forests from a similar regression that excludes the neighboring stocks.[8]

Neither land equality, nor caste heterogeneity have a statistically significant effect. The signs are the opposite of those in the previous regressions. The share of woman panches (not included in the regression reported here), also has no measurable effect.

This is a reduced form for a model in which the underlying exogenous variables measuring heterogeneity affect the frequency of meetings and the hiring of a watchman, which in turn affect the quality of the forest. But the difficulty in estimating the model directly is that no instruments were available for the watchman and frequency of meetings. Any variable that affects these is likely also to affect the value of the forest, and its quality directly.

The last column of Table 3 reports a linear regression of crown cover in the pine parts of the Panchayat forests on the explanatory variables. The coefficient on land equality, significant at the 10% level, is 0.56, meaning that a 10 percentage point increase in land equality raises crown cover by 5.6 percentage points. Including controls with or without valley fixed effects, tends to increase the precision of the estimate, which fails to be significant at the 10% level only for the same specification with valley fixed effects. Nevertheless, the coefficient is always positive across specifications, ranging from 0.39 up to 0.69. The other coefficients of interest, on caste heterogeneity, and the share of women in the Panchayat are not significant, as before.

To summarize, there is no evidence to show that caste heterogeneity or the share of women in the Panchayat has an effect on collective action to manage the forests. The effect of land equality is less clear. On the one hand, there is the evidence for the positive effect of land equality on the frequency of Panchayat meetings and on crown cover in pine forests. On the other hand, there is no effect on the probability of a watchman being hired. Nor is there any effect on broadleaved forest cover. As pointed out earlier, villagers generally have a greater interest in the preservation of broadleaved, as compared to pine forests.

**Conclusion**

[8] For further details, see Somanathan, Prabhakar, and Mehta (2002).

Contrary to much speculation on the role of caste in collective action, no correlation between caste heterogeneity and indicators of collective action or forest cover was found. There is some evidence to indicate a link between land equality and one of the indicators of collective action as well as between land equality and forest cover in pine forests. However, the absence of any link between land equality and forest cover in broadleaved forests and the other indicator of collective action makes it difficult to interpret this finding. The crude measure of inequality that we possess may also obscure relations which do exist.

As pointed out in the introduction, the community forest setting examined in this paper offers a test of whether heterogeneity of different kinds hinders collective action in a very direct way, making it harder for agreements to be reached. The main finding is that, at least in this region, there is no evidence that ethnic heterogeneity hinders collective action. There is some evidence that land inequality may hinder collective action. No gender effect on collective action was found. These results are in contrast to those found at larger levels of aggregation or in different contexts by various scholars. This may be because collective action in the context of village forestry may not face the hurdles that it does in other situations where collective action has to mediated by political processes or involves choices about the types of public goods to be provided. It could also be, of course, particular to the region studied, perhaps because inequality and ethnic divisions are not as pronounced and, therefore, variable, in comparison to other areas.

## References

Agrawal, Arun, and Yadama, Gautam N. (1997). "How do Local Institutions Mediate Market and Population Pressures on Resources? Forest Panchayats in Kumaun, India." *Development and Change*, 28: 435-465.

Aggarwal, Chetan (1996). "Boundary and Property Rights in Uttarakhand Forests." *Wasteland News*, Feb-March 1996.

Alesina, Alberto, Reza Baqir, and William Easterly (1999). “Public Goods and Ethnic Divisions.” *Quarterly Journal of Economics*, 114(4): 1243-84.

Anon. (1984). *Van Panchayaton Ki Karya Pranali Ka Moolyankan Adhyayan*. Government of Uttar Pradesh, Lucknow.

Ballabh, Vishwa, and Katar Singh (1988). "Van (Forest) Panchayats in the Uttar Pradesh Hills: A critical analysis". Research Paper, Institute of Rural Management, Anand.

Bardhan, Pranab, and Jeff Dayton-Johnson (2001). “Inequality and the governance of water resources in Mexico and South India.” Mimeo, UC Berkeley.

Prabhakar, R., E. Somanathan and Bhupendra Singh Mehta (2001). "How Degraded are Himalayan Forests?" URL: http://www.isid.ac.in/~som/#WP

Raju, Manju S. (1997). "Seeking Niches in Forest Canopy: An enquiry into women's participation". Mimeo, Institute of Rural Management, Anand.

Saxena, N.C. (1987). "Commons, Trees and the Poor in the Uttar Pradesh Hills". Network Paper 5f, Social forestry network, Overseas development Institute. London.

___________ (1995). "Towards Sustainable Forestry in the U.P. Hills." Centre for Sustainable Development, Lal Bahadur Sastri National Academy of Administration, Mussoorie.

Singh, Satyajit (1998). "Collective Dilemmas and Collective Pursuits: Community Management of *van panchayats* (forest councils) in the UP Hills", mimeo, University of Sussex.

Somanathan, E. (1991). "Deforestation, Property Rights and Incentives in Central Himalayas." *Economic and Political Weekly* 26:PE37-46.

__________, R. Prabhakar, and Bhupendra Singh Mehta (2002). "Community vs. State Management: Forest Quality in the Indian Central Himalayas", mimeo, Indian Statistical Institute, Delhi.

Tiwari, A.K., and J.S. Singh (1984). "Mapping Forest Biomass in India through Aerial Photographs and non-destructive field sampling." *Applied Geography* 4: 151-165.

_____________(1987). ``Analysis of Forest Land-use and Vegetation in a Part of Central Himalaya, Using Aerial Photographs." *Environmental Conservation*, 14(3): 233-244.

Vasan, Sudha. (2001). "Ethnography of the Forest Guard: Contrasting Discourses, Conflicting Roles and Policy Implementation." Paper presented at the Workshop "Rethinking Environmentalism", Dept. of Sociology, Delhi School of Economics, December 6, 2001.