

## Community Management is Good for Forests: Results from a Field Experiment in India

**Over the last several decades forest management in India has moved towards increasing the involvement of local people. At the same time globalization and commercialization have brought significant pressures to bear on forest communities and the relationship they have with their environment. Now a SANDEE study looks at the relationship between indigenous people and their forest homes using a novel field experiments approach.**

The study is the work of Rucha Ghate and Suresh Ghate from SHODH: The Institute for Research and Development, Nagpur. It shows that the relationship between indigenous communities and their local forests is generally non-exploitative and non-commercial. The study also shows how the introduction of communication between forest harvesters moderates their forest use and makes them behave more consistently. The results underscore the importance of initiatives, like India's Joint Forest Management (JFM) program, which provide opportunities for communities to make collective decisions and which help people use their local forest resources sustainably with a view to benefit sharing.

### THE COMMUNITY MANAGEMENT CHALLENGE

A number of policies since the 1980s have highlighted the Indian government's resolve to promote the role of local communities in the management of forests. The Joint Forest Management (JFM) program, which started in the early 1990s, is the most significant of these initiatives. It encourages the involvement of local communities in the management of state-owned forests under partnership arrangements with the state Forest Department (FD). It also provides opportunities for forest communities to discuss forest management amongst themselves and to make collective decisions about how to proceed.

The process of decentralization of India's forest management has not been without its critics. Some argue that the Government has not devolved enough authority to local communities; others say that the Government has placed too much confidence in traditional sustainable practices as well as in the capacity of communities to manage the forest resource. At the ground level, the JFM program is currently suffering because, in many instances, both sets of parties involved (i.e. the Forest Department and the forest communities themselves) are not ready for the new institutional arrangements. This uncertainty makes it important to try and understand the nature of the current relationship between forests and the indigenous rural communities in India.

### THE STUDY AREA: SIX VILLAGES IN MAHARASHTRA STATE

The study is based on field experiments conducted in six villages, across the state of Maharashtra, which is one of the largest states in India. The six villages are geographically fairly well distributed and are all covered by

## THE CASE FOR FIELD EXPERIMENTS

Field experiments increasingly play an important role in studies relating to the behavioral aspects of subjects by simulating real life situations. They allow for the re-creation of an environment in a form that captures the typical characteristics of a real world scenario. *“Distinct from traditional empirical economics, field experiments provide an advantage by permitting the researcher to create exogenous variation in the variables of interest allowing one to establish causality rather than mere correlation”* (Reiley and List, 2007, p.2)<sup>1</sup>. Thus, in behavioral economics, economists are widely resorting to field experiments as a means of supplementing data from surveys. Field experiments also come in handy to construct and test theories and measure key parameters.

Although there is greater recognition of field experiments as a more faithful way to gather data in instances where there are incentives for truthful revelation of behavior/information, this method is not without problems. For example, control, which is one of the most striking features of experiments, may not be perfect. Further, due to logistical/practical constraints, the number of participants in an experiment is likely to be small, hence raising questions regarding the significance and relevance of the inferences made from the observations which are small in number. Another issue pertains to the representativeness of the participants.

In the case of the experiments conducted in this study, all six communities were predominantly indigenous (the control for cultural and social factors) and poor (the control for economic factors). However, women did not volunteer to participate in the experiments, thus representation was not universal. A major advantage, however, was that the participants were actual harvesters of the forest resource. Therefore, the experiment was not about an artificial situation, but very much about a situation that they were familiar with.

<sup>1</sup> Reiley, D. H. and J. A. List (2007). 'Field experiments in economics', New Palgrave Dictionary of Economics, Available at: <http://www.u.arizona.edu/~dreiley/papers/PalgraveFieldExperiments.pdf>. (accessed on May16, 2009).

**Table 1: Sample Village Profile**

Village	Aire	Gadhaddeo	Bijrigavhan	Talwada	Zhimela	Khongda
Population	1429	2160	1040	246	392	469
No. of HHs	243	522	189	66	78	82
Distance from Nearest Town(km)	9	3	5	10	18	9
Average Land Holding (ha)	2	1.2	1.2	0.8	1	1
Migration (does it take place?)	Yes	Yes	Yes	No	No	Yes
Forest Area (ha)	634.41	1781.6	154.63	522.05	575.26	871.52
Year of JFM	2003	2005	2006	2004	1999	2000

the JFM program. The chosen villages were: Aire, Bijrigavan, Gadhaddeo, Talwada, Zhimela and Khongda. The area of forest around these villages varies from 1781.6 ha, in the case of Gadhaddeo, to 154.63 ha in the case of Bijrigavhan.

Agriculture is the dominant occupation in all of the villages, with average land holdings varying from 0.8 ha in Talwada to 2 ha in Aire. Mainly indigenous communities inhabit the villages, which range in size from 66 households (with 246 individuals) in Talwada to 522 households (with 2160 individuals) in Gadhaddeo.

To assess the attitude of the indigenous communities towards their local forest resources, the researchers conducted field experiments in each of the six villages. Each experiment consisted of two games, each of which was played by a team of five villagers. These games were designed to see how the villagers regarded the forest resource and whether they considered sustainability issues in their harvesting decisions.

## PLAYING GAMES TO INVESTIGATE COMMUNITY VALUES

The two games played in the villages in Maharashtra were non-communication (or open access) and the communication (JFM) games respectively. The teams that took part were representative of the different age groups, levels of education and land ownership in the study villages. Due to cultural constraints in the research area, only men participated in the experiments.

Participants in each game were presented with a board on which a 'forest' comprising a hundred trees was displayed. Participants were told the maximum number of trees they could harvest in any given round. They then decided how many trees they would harvest. Participants were entitled to a payoff of INR 10 for each tree harvested. At the end of each round, they were told about the total harvest for the group. The participants played each game for up to ten rounds.

In order to mirror the effect of forest regeneration, at the end of each round 10% of the remaining number of trees was added to the pool of trees to be considered in the next round. Throughout each game the resource size did not exceed 100 (which was the capacity of the forest) at any stage.

The only difference between the two games involved the communication that took place between players. In the first game there was no communication between the participants. In the second game participants were allowed to communicate throughout the game. This allowed them to make collective decisions, to formulate strategies and rules for harvesting, and to try to identify any rule-breakers.

**Table 2: Indicators of Forest Quality**

Village Name	Stand Basal area (ha)	Stems per plot	Mean Height	Forest Score
Aire	16.65	4.97	10.12	31.74
Gadhaddeo	2.82	2.27	5.22	10.31
Bijrigavhan	3.08	2.57	8.93	14.58
Talwada	19.74	9.63	13.8	43.17
Zhimela	8.74	8.14	12	28.88
Khongda	15.00	7.12	13.7	35.82

## LOOKING AT THE ENVIRONMENTAL PERFORMANCE OF VILLAGES

Overall, the games were designed to shed light on each participant's attitudes to the forest resource and how this affected their individual behavior. The games also highlighted the way in which communication between participants affected the behavior of each individual. While the first game tried to replicate the open-access harvest situation, the second tried to mimic the JFM situation by allowing the participants to discuss and communally decide forest use and harvest strategies.

Although the field experiments were the primary way in which information was gathered, supporting data was also collected from a wide range of other sources. At least one focus group discussion was held in each village and information was gathered from 60 household heads, using a structured questionnaire. At the institutional level key informant interviews were used to collect data.

The information that was collected was used to develop a set of indicators for how well the JFM committees in each village were functioning. The indicators were: (i) the forest maintenance and improvement activities that each village was undertaking; (ii) the conservation measures undertaken by JFM committees; (iii) the level of awareness the committees had about the requirement of the JFM and whether they had a plan for forest protection. Each village was given a score, depending on how well it was performing.

## HOW THE VILLAGERS PERFORMED

The study finds that villagers' harvesting decisions are not always affected by short-term gains, but that they are also affected by factors such as their community and acquaintances, by their culture and by communication with other harvesters. The study indicates that, irrespective of the presence of formal institutions and the quality of the forest in which the indigenous communities live, their attitude seems to be non-exploitative and non-commercial.

Given the structure of the game, the players could have maximized their gains and harvested a maximum of 23 trees in the non-communication game or with the additional information that the game would not continue beyond ten rounds, 33 trees in the communication game. In reality, however, none of these exploitative or maximizing strategies was adopted. For example, out of 60 individual harvesting decisions (5 players x 6 villages x

2 types of games) there were just five (8.33%) instances of a harvest of 23 or more trees, all in the non-communication game.

## HOW COMMUNICATION HELPS SUSTAINABILITY

The study shows that communication not only boosts sustainable behavior but also leads to equality of harvesting. In addition, communication brings parity in pay-offs at both inter- and intra-community levels. It also moderates harvesting patterns: where harvesting is high in the non-communication situation, communication leads to a reduction in harvesting. In situations where harvesting is low, it leads to an increase, without compromising sustainability. (For more details of the experimental results please see the side bar.)

The study finds that it is easier for communities located in well-stocked forests, to harvest sustainably than it is for communities in degraded forests. However, overall the sustainability of the forest resource seems to be a priority for most of the forest dwelling communities. What is interesting is that, from the point of view of economic rationality, this harvesting behavior seems irrational, as villagers do not optimize the pay-off they can get from harvesting trees. This indicates that their



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attitude towards the forests is not predominantly 'economic'. This kind of behavior is what researchers call "*better than rational*" because, in addition to ensuring the sustainability of the natural resource, it leads to equality of resource use.

## THE IMPORTANCE OF PROMOTING COMMUNITY FOREST MANAGEMENT

In terms of the functioning of the JFM program in each of the villages, the study found a mixed picture. The big villages of Aire, Bijrigavan, and Gadhaddeo had some forest protection mechanisms in place, while the three smaller villages did not have any specific strategies to protect their forests, mainly because of the abundance of good quality forest nearby. Interestingly, Khongda (which was one of the smaller villages) had some conservation measures in place. This was primarily because it is located on the periphery of the Melghat Tiger Project and forest officials are vigilant regarding forest use by the villagers.

One of the key lessons that can be drawn from this study is that the JFM program is a step in the right direction when it comes to the decentralization of forest management. As the study has shown community management has the potential to be sustainable and this is made more likely if communication between harvesters is encouraged. The JFM program expects communities to formulate their own operational level rules for regulating the use, monitoring, guarding, and protection of the forest resource. It therefore provides a platform for communities to make collective decisions at both general body and executive body meetings. As such, it is an approach that should help optimise the sustainability of community forest management. Therefore, the government needs to identify the factors that hamper the effective implementation of the program. Policy makers should then adopt corrective measures that take better advantage of the pro-conservation attitudes of indigenous communities.

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