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Social Change 2010 40: 479

DOI: 10.1177/004908571004000405

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Collective Action for Sustainable Forestry: Institutional Dynamics in Community Management of Forest in Orissa

Social Change
40(4) 479-502
© CSD 2010
SAGE Publications
Los Angeles, London,
New Delhi, Singapore,
Washington DC
DOI: 10.1177/004908571004000405
<http://socialchange.sagepub.com>


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Abstract

The article examines the efforts for collective action of ten village communities in the state of Orissa to manage their local forest resources from an institutional perspective. It explores the differential levels of success in the collective action efforts of these communities, and the role of local level community institution therein, for ensuring sustainable resource use and management. The article concludes that only presence or absence of the institution is not always sufficient for sustainable resource management outcomes, despite being a necessary condition for it. The existing institution must be a robust one with strong rules for resource appropriation and good monitoring system. Institutional arrangements for sustainable resource management at the community level must be understood as a dynamic process, which involve a continuous interaction among the community members and the designed institution. The institution formulates the rules and expects the community members to comply such rules. The rule formation should necessarily be backed by a strong and efficient monitoring system to ensure that rules are complied, and accordingly the institution can accord positive incentive in the form of rewards to those who show conformity to rules and negative incentive through punishment to those who violate them. The institutional arrangements without such a strong monitoring system fail to restrict free-ride and hence, could not establish a well-defined property right regime over the resource, which is very much essential for ensuring successful collective action.

Keywords

Community forestry, collective action, common property, institutions, property rights

Introduction

The disappointing results of natural resource conservation policies in developing countries and the subsequent depletion of forest and other natural resources over the past few decades, have forced the scholars, development practitioners and bureaucrats to shift their focus away from state-centred policies of conservation towards solutions at the local level. The resource degradation of the recent few decades has not only altered the world ecology and environmental scenario at the global level, but has challenged the livelihood security of thousands of indigenous population at the local level too. The intrinsic relationship that the communities share with their local resources and not undermining their inherent dependency upon those resources, it has been argued that policies regarding sustainability of the resource cannot be designed without integrating these communities in management strategy.

Acknowledging the role of local communities in halting the degradation of natural resources and promoting sustainable resource use and management, this article aims to examine the efforts for collective action of ten village communities to manage their local forest resources from an institutional perspective. First, drawing insights from the empirical work in ten village communities in Orissa, which are adjacent to forest areas, the article tries to explore the differential levels of success in the collective action efforts of these communities for ensuring sustainable resource use and management. Second, the article examines the role of local level community institutions in collective action for sustainable resource management.

The article is divided into five sections. Following the introduction, the second section deals with larger issues of institutional and policy changes concerning natural resource management and examines the possibilities of community-based approach as an alternative strategy in resource management. The third section gives a review of literature on institutions and common property management and specifies the analytical framework for the study. The fourth section empirically analyses the process of collective action for sustainable forest management and stratifies the degrees of success of the community institutions. In the conclusion, the article discusses the role of the community institution in ensuring sustainability of the local resource base.

Institutional Change for Resource Management: Community-based Approach as an Alternative Strategy

In the literature concerning common pool resources, ever since the publication of the Hardin's (1968) article on 'tragedy of the commons', scholars have been focusing on evolving a solution to the problems of overuse and degradation of common pool natural resources. Hardin's thesis concludes that co-users of a common

pool resource are trapped in a situation in which, in the absence of any regulated access to the resource, each rational user is motivated to consume/use more and more units of the resource system till the resource is completely degraded. Thus, collective and unregulated use of common pool resource will finally lead to overuse and degradation of the resource, and individual rationality of each user will not favour any coordinated action to regulate the use of the resource. Such being the inherent problem in common pool resources, the solution, which is often put forth by Hardin and many other scholars (Demsetz, 1967; Hardin, 1978; Ophuls, 1973; Smith, 1981), is either to nationalise or privatise the resource, wherever feasible.

It is important to point out that both the solutions to the problems of common pool resource emphasise on the physical sustenance of the resource and its availability over a period of time, ignoring the needs and requirements of the users of the resource. While designing strategies for the management of natural resources, ensuring physical availability of the resource is as important as the requirements of the members of the community who make use of the resource for their daily livelihood. Further, scholars also opine that nationalisation converts the common pool resource to a *de jure* state property, while in reality degenerating it into *de facto* open access regime (Arnold, 1998; Arnold and Stewart, 1991).

Notwithstanding the pessimism of scholarly writings on commons (for example, Hardin, 1968), and the persistent problems of free-riding and resource degradation as a result of overuse and congestion, there has been no dearth of instances of community-based collective action efforts to manage local resources successfully (Berkes, 1991; Bromley et al., 1992; NRC, 1986; Ostrom, 1990). The case studies depicting success stories of resource management by local communities have challenged the notion that state control and privatisation are necessarily the only preferred solutions to avoid the situation of tragedy, which is so intrinsic to common pool resources. Consequently, the community-based approach to management of natural resources has been acknowledged as an alternative strategy.

Why Community-based Resource Management?

The shift in the policy approaches towards resource management has always been accompanied with renewed interest in the academia in studying local communities as potential resource managers, and in turn, the resurgence of community to the centre stage in development and resource management policies. Besides the state's failure in achieving desirable resource management outcomes, there are a few specific reasons for the worldwide shift to community-based approach as an alternative strategy for resource management.

1. Local communities, in most developing countries, share an intrinsic relation with the natural resources and continue a day-to-day interaction with the natural resource base. This is also the case with the protected areas and reserved forests, where the state enjoys absolute property rights over the

resource and excludes the local people from accessing it. It is estimated that throughout the world, perhaps half of the protected areas are inhabited (Borrini-Feyerabend, 1996). In India, over two-thirds of protected areas have human habitation, and a larger proportion have some form of human activity apart from tourism (Kothari, Pande, Singh and Variava, 1989). Such being the situation, exclusion of local communities from resource management is not always a desirable or possible strategy.

2. The resource management efforts which exclude the local communities often result in serious conflicts over resource use. Kothari et al.'s (1989) survey of 222 protected areas in India reveals that at least 47 of them had had physical clashes between people and forest officials. There are many instances where people are demanding de-reservation of the protected area status, since they legitimately perceive their alienation from the resources they need for survival as being unjust. Finding solutions to such conflicts points towards treating communities as equal partners in resource management.
3. Community-based approach in resource management is also favoured owing to the indigenous knowledge of resource dependent communities. Local communities, especially those which have a long history of peaceful coexistence with nature, possess in-depth knowledge and experience about the resource, which, if taken into account, will be of immense value both to resource management efforts and to the community. Further, with the help of local knowledge and local people's cooperation, there is a possibility that the costs involved in natural resource management can be reduced (Kothari et al., 1989).
4. With the spread of popular democracy and decentralisation, and above all with increasing demand on people's participation, the unrepresentative policies of conservation are no longer free from criticism (see, Agrawal and Gibson, 1999). The reflections of policy changes at the larger level for deepening democracy, widening development up to the grassroots level and empowering the indigenous population have also become visible in the natural resource sector. Empowering the local people, accelerating their development process and allowing them a greater say in the policies that affect their livelihood can be perceived only through uplifting 'communities' and giving them a share in natural resource conservation.
5. The increasing presence of civil society and evolution of non-governmental organisations (NGOs) as an intermediary in development, which relies more on community than the state, also contributes to the changing status of community in the conservation debate today. The efforts of the NGOs to amplify the voices of the local indigenous population, and build their capacity for collective action at the local level for their own development have also helped the community regain its strength and be able to conserve and manage its local natural resources. Further, the flow

- of heavy financial aids from external donor agencies, which emphasise on local knowledge and people's participation, boost the communities to take the lead role in conservation activities with the help of local NGOs.
6. The scholarly writings about the ecological histories, environmentalism and success stories of communities managing their local resources sustainably also strengthen the position of the community as a potential resource manager. Historical ecologists emphasised the 'anthropogenic' nature of forest and the inalienable history of environments and human population (see, Anderson and Posey, 1989; Denevan, 1992). Scholars have pointed out now that there can be many occasions in which human activities and desirable levels of biodiversity can coexist (see, Arhem, 1985; Michon and Foresta, 1990; Posey, 1985; Saberwal, 1998; Western, 1989). Such possible coexistence paves the way for inclusion of local communities in strategies for effective management of these resources. Even the Indian environmental historians (see Gadgil and Guha, 1995; Guha, 2000; Guha and Martinez-Alier, 1997) have also pointed out the peculiarity of Indian environmentalism, which lies in its inseparability from human population. Unlike northern America, where a clear distinction between natural landscape and human establishment exists, the Indian natural landscape has always coexisted with human population. Under such conditions, it becomes clear that any policy aiming at excluding local communities from conservation activities is bound to fail.
 7. The advancement of research in common property has also glorified the capabilities of local communities in sustainable management of its local natural resources (Berkes, 1991; Bromley et al., 1992; McKean, 1992; NRC, 1986; Ostrom, 1990; Wade, 1988). These works point out towards community as a suitable alternative to nationalisation and privatisation, highlighting the importance of local knowledge and local institutional arrangements.

Recognition of the significance of community in conservation and management activities of natural resources leaves us with a further question: Are all communities equally capable for sustainable resource management? If returning back to community is the preferred solution to the problems of over-use, free-riding and degradation of natural common pool resources, then why some communities vary with respect to their capability in ensuring sustainability of the resource in their effort to manage the local resources. The answer to such questions lies in the kind of institutional arrangements that exist in the resource managing communities, since the existing institutional arrangements direct the resource management outcomes to a great extent. The following section, therefore, discusses the role of community institutions in the management of local (common pool) resources and ensuring their sustainability.

Common Pool Resources, Institutions and Sustainability: A Theoretical Underpinning

Defining Common Pool Resources

Before going further towards discussing the role of communities and their institutions in the management of local common pool resources (CPRs) through collective action, we should look at the question as to what is CPR and why CPR requires collective action at all.¹ Common pool resources can be defined as that natural or man-made resource, from which it is difficult to exclude other potential users from using the resource and such joint use by more than one user involves subtractability (Ostrom, 1986a; Berkes and Farvar, 1989). Common pool goods are distinguished from two other types of goods, that is, pure public goods and private goods. Such classification of goods is based on changes along two analytical dimensions: exclusion of others from the resource and jointness of use. In the case of pure public goods, it becomes not only difficult but also sometimes impossible to exclude the co-users from using the resource, but such joint use does not involve subtraction of the resource. For example, while it is difficult to exclude somebody from using the services provided by a street light, at the same time one's use of such service does not necessarily affect other's use of the same service. On the one hand, private goods can be easily excluded from outsiders, on the other hand, if joint use of the good begins then the resource starts to deplete. Thus, CPRs exist in between the pure public goods and private goods, and share the characteristics of subtractability with the private good, on the one hand, and the characteristics of non-excludability with the pure public good on the other (McKean, 2000).

The twin characteristics of 'subtractability' and 'non-excludability' make the CPR a special kind of resource, in which it becomes difficult to protect the resource from depletion if some mechanism to exclude the non-contributing users is not devised. Proper maintenance of CPRs requires some kind of institutional arrangements of property rights or resource management regimes through collective action to exclude the non-members or non-contributors from availing benefits from the resource. In the absence of such collective institutional efforts to address the problems of exclusion and joint use, CPRs become *de facto* 'open access resources' accessible to anyone. To put it precisely, the management of CPR requires collective action at the community level owing to three factors. First, the good is jointly produced, or else it would not require collective action at all. Common pool resources are such that they cannot be produced in isolation by any single individual's effort. It requires joint or common efforts by the community for its production and management. Second, CPR confer benefits on all members of the group, making it impossible or impracticable to exclude members who fail to contribute for production of CPR. Third, production of benefits in CPR involves cost, which should come from all the members of the community (Heckathorn, 1993:331).

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Problems in Commons Management

Having acknowledged the necessity of the process of collective action in the production of CPR, we now move forward to discuss the challenges that resource users face in use and management of such CPRs. In any CPR situation, the resource users mostly face two problems: problem of providing the resources (provision problem) and the problem of appropriating the resource (appropriation problem) (Ostrom, 2001). Provision problem in CPR focuses on investment for production and maintenance of the resource itself. Production of benefits from CPRs often requires long-term investments for the construction of the resource and its proper maintenance. Provision problem involves determining the type and level of regular maintenance that will sustain the resource system over time. It is important to note that in CPRs investments are usually long term, in which costs are incurred in present while the benefits out of it are acquired in future, making it difficult for taking any decision for investment. When this difficult long-term problem is combined with free-riding of other resource users, maintenance of a resource system becomes a challenging task.

With regard to the appropriation problem in CPR environment, key focus is how to allocate a fixed amount of resource among resource users so as to avoid conflicts over the assignment of rights.² Equitable distribution or allocation of benefits forms an important appropriation problem in most CPR environments. In the absence of a firm rule on who can appropriate how much in a CPR environment, the situation becomes like a Prisoner's Dilemma game and free-riding becomes inherent. In such cases none will have any incentive to leave any portion of the resource for other user, which ultimately result in degradation of the resource system. However, if the access to the CPR is limited and a well-defined group of users rely on the resource jointly, the incentive of the users to appropriate will depend upon rules governing the nature of appropriation, and their enforcement and monitoring.³

Despite the fact that free-riding and lack of coordination poses a serious threat to collective action, several scholars have pointed out conditions required for successful collective action at the community level for the effective management of CPRs.⁴ Among several other factors pointed out by these scholars, the presence or absence of 'institutions' is a prominent one, which plays a crucial role in shaping the efforts for collective action by members of the community. Ostrom's (2001) analysis also suggests that the other two problems (provision and appropriation) in the CPR context arise because of institutional problems. In the absence of institutional arrangements to design firm rules regarding access to and allocation of resource, the twin problems of provision and appropriation becomes prominent and stand in the way of collective action for sustainable management of CPRs. It is, thus, essential to clarify what 'institution' means in the first place in the context of CPRs.

Institution as the Solution

A study of institutions, in the context of CPR, focuses on the laws and conventions of community that either directly allocate resources, or establish processes and constraints for its members to make allocative decisions. Notwithstanding the use of the term ‘institution’ in our day-to-day life, it is mostly used with reference to rules, regulation and prescriptions to behave in a certain way. It is often defined as rules about behaviour, ‘especially about making decisions’ (Rinker, 1982: 4), and about ‘individual expression and choice’ (Pillott, 1979: 156). However, focusing only on the ‘rules’ does not serve the purpose of defining institutions properly. In her attempt to define ‘institutions’, Ostrom (1986b: 5) distinguishes rules from physical and behavioural laws and stresses upon the prescriptive nature of rules, which refers to ‘actions that are required, prohibited or permitted; and are commonly known and used by a set of participants to order repetitive, interdependent relationships’. The prescriptive nature of rules becomes visible from the fact that people who follow certain rules always know and internalise that if they violate rules, other individuals will hold them accountable for that.

There has been considerable disagreement by scholars over the nature of rules. Scholars like Ganz (1971) and Shimanoff (1980) limit the scope of prescriptive rules to only ‘obligation’ and ‘prohibition’; while on the contrary, Commons (1957) and V. Ostrom (1980) include ‘permission’ in their conception of rules (cited in Ostrom, 1986b). Such limitation of the scope of rules by these scholars, whether to ‘prohibition or permission’, arises from their very way of defining rules as prescribing a particular action to be done. Instead, Ostrom considers rules as providing a set of outcomes or actions, which it does in three ways: first, by forbidding certain action; second, by permitting certain actions or outcomes; and third, by requiring a particular action or outcome. The third type of rules expects individuals to perform a particular action and is less used in everyday life.

Ostrom defines institutions as ‘a set of working rules that are used to determine who is eligible to make decisions in some arena, what actions are allowed or constrained, what aggregation of rules will be used, what procedure must be followed, what information must or must not be provided ...’ (Ostrom, 2001: 167). For Ostrom, working rules may not necessarily represent, be a part of, or be backed by formal laws that are designed by legislative regulations. However, this should not lead one to conclude that working rules are always formed beyond the purview of formal laws. Formal laws are important sources of working rules among several others.⁵ When formal laws are known to all the participants, actively enforced and its violations are monitored, coercing those who violate them, they become working rules (Ostrom, 2001: 167–68). Thus, common knowledge, enforcement and monitoring are three important features of working rules or institutions.⁶

Arguing in a similar tone, North (1991) defines institutions as humanly devised systems that structure the interaction of its members in social,

economic and political arenas. As an organised and well-defined system, it constrains some behaviours and favours or facilitates others. It enforces sanctions negatively in the form of punishments when its prescribed rules are violated and positively in the form of rewards when such rules are complied. Institutions exist both as formal entities through constitutions, laws and well-defined property rights, and as informal agents through customs, traditions, norms, codes of conduct, social taboos etc. Institutions, thus, form the basis for human interaction and relationship among individuals within a society, consisting of both formal and informal entities. They provide a set of rules for cooperation and competition and thereby adjust conflicting claims of different members of community and of groups for scarce resources.

It has now been affirmed that the presence of institution is very much necessary to maintain CPRs. In fact, it is the institutional arrangements which create a property right in resources, establish management regimes and distinguish common property from open access resources.⁷ When the designed institution restricts the access of non-members into the resource and entrusts joint property right to the users of the resource, common property regime is said to be evolved. With the presence of an institution, the property becomes inaccessible to all openly, rather the access is limited to a specific group of users who hold their right in common (Bromley and Cernea, 1989; Bromley et al., 1992; Runge, 1981, 1984, 1992).⁸ Such an institutional arrangement in resource, where access to the resource is limited to specific members, which can be easily distinguished from the non-members, and where the user group or the community holds property in common and share rights and duties towards the resource, is known as common property regime.⁹

Collective Action, Community Institution and the Forest

The empirical work for the research was carried out in ten forest fringe villages in the Dhenkanal Sadar Block of the Dhenkanal district of Orissa. The villages were chosen purposively, based on the criteria that they lie within a distance of three kilometres from the forest, they have sufficient dependency on the forest and the communities have some kind of experience in collective mobilisation for management of their local resource. Case study method, supplemented by group discussions and in-depth interviews with key informants was used to elicit the necessary information regarding forest use, dependency and efforts to its sustainability management. During the course of inquiry, information regarding social composition of the members of the village community, their past history of forest protection and their degree of success in collective action in designing institutions for effective management of local forest resources were collected. The following table (Table 1) indicates the names of the villages, their social composition and their experience in forest protection.

Table 1. The Study Villages

Name of the Village	Social Composition	Since when Protecting	Collective Action
Gangadhar Prasad (G. Prasad)	Heterogeneous	1985–	High
Jhankira	Heterogeneous	1960–	High
Biradia	Heterogeneous	1993–98	None
Ambanali	Heterogeneous	1993–98	None
Kadua	Homogeneous	1993–98	None
Krushna Kumar Pur (K.K. Pur)	Heterogeneous	1993–98	None
Nagia Pasi (N. Pasi)	Heterogeneous	1991–	High
Korian	Heterogeneous	1996–	Moderate
Krushna Prasad (K. Prasad)	Heterogeneous	1986–	High
PadmaLav Pur (P.L. Pur)	Heterogeneous	1986–	Moderate

Source: Field Survey.

Social Composition of the Villages

The social composition of the villages is very much similar with other villages of rural Orissa. All the villages except Kadua are multi-caste villages. The village Kadua is a completely tribal village situated inside the Kapilas Reserved Forest. One of the striking features of the remaining nine villages is that both caste and tribe coexist in these villages. People from several caste and sub-castes found in Orissa, such as, Brahmin, Karan (record keeper), Khandayat (traditional warrior caste), Chasa (cultivator caste) Teli (oilman), Tanti (weaver), Barika (barber), Keuta (fisherman), Gouda (milkman) and schedule castes and scheduled tribes, reside in these villages. Social structure of the villages is very much stratified, with Brahmins at the top and Scheduled Castes at the bottom. Though the scheduled tribes do not come under caste system generally, but in these villages, as both caste and tribes coexist, tribals are looked down in the general social hierarchy. Agriculture is the primary occupation for most of the caste groups. The scheduled castes and scheduled tribes, who are mostly landless or possess very meagre amount of land, work as agricultural labourers in the fields of higher caste people.

Resource, Resource Dependency and Resource Protection

All the villages except Jhankira and Gangadhar Prasad (G. Prasad) are situated in the vicinity of the Kapilas Reserved Forest of Dhenkanal district. The legal status of the forest area near the village Jhankira and G. Prasad was that of village forest as per government records.¹⁰ The forest has been an important source of

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livelihood for a majority of the population of the villages. Collecting fuel wood, sal leaves and other forest produce from the forest are the major occupation of the tribals in the villages. Almost all the villagers depend upon the forest for fuel wood. The poor people, mainly tribals and other lower caste people, collect the fuel wood themselves, whereas the rich employ others to collect fuel wood for them on payment basis. The farmers collect small timbers from the forest to make agricultural equipments. There are certain agrarian festivals during which the farmers collect small timber to make new equipments. Collection of forest produce has been the sole source of livelihood for certain families. Particularly members from the scheduled tribes collect sal leaves, sal seeds, mahua flowers, rope-making material, fuel wood and several other forest produce from which their daily expenditure comes. There are certain basket-maker families from among the schedule castes who depend upon forest for bamboo to be used as raw material in basket making. While the male members of the family collect bamboo from the forest, it is the female members who make baskets out of it. Every household depends upon forest at the time of annual repairing of the house. As most of the houses are *kachha* houses with thatched roofs, people have to depend upon forest for bamboos, ropes and other things that are required at the time of annual maintenance.

The communities differed with each other with respect to their experience in collective mobilisation for resource protection, which ranges from 5 to 40 years. Out of the ten villages, collective efforts for forest protection did not exist in four villages, that is, Biradia, Ambanali, K.K. Pur and Kadua, during the field work. In the remaining six villages, there were institutional arrangements for local resource management with different degrees of functionality. The above-mentioned four villages started protecting their forests around 1993–94 and by 1998, the forest protection committees had become non-existent. Now, the forest attached to these villages is a kind of ‘open access resource’ and has become a major attraction for wood contractors.

The village Jhankira had the maximum experience of collective action efforts for forest management. The village has been protecting its ‘village forest’ since 1960. In the remaining five villages, where community institution existed, the protection efforts started during the mid 1980s. That was the period when community forestry was gaining momentum in Orissa. The Government of Orissa had passed its Village Forest Rules in 1985 giving the responsibility of village forests to local communities. By 1990, the Orissa government had passed several resolutions giving a share to local communities in the management of protected forests. Finally, in 1993, the Government of Orissa came out with its Joint Forest Management programme. Encouraged by these efforts of the government and owing to their own requirements these villages formed forest protection committees to manage their patch of forests. With the formation of protection committees, the forests, which were a sort of ‘open access resource’, became common property with a clear set of rules about who will enjoy the benefits from the resources. The forest protection committees started in G. Prasad in 1985, in

K. Prasad and P.L. Pur in 1986, in N. Pasi in 1991 and by 1996 the village Korian formed such committee. The self-initiated protection committees of K. Prasad, N. Pasi and Korian got recognition from the local DFO's office and were registered with the Joint Forest Management (JFM) programme of the Government of Orissa. However, the village forest protection committees of G. Prasad, Jhankira and P.L. Pur were functioning independently at the time of field work.

The Institutional Arrangements and the Rules in Use

The presence of community institution in the six study villages was observed to play a crucial role in ensuring sustainability of collective action efforts for local resource management. In the context of natural resource management, the institutions refer to rules about who could use what resource, when, where and how. The complete array of this rule structure is known as 'institutional arrangements', which determine the way of resource appropriation. The institutions, in the study villages, were responsible for designing rules for forest protection and for ensuring their conformity by the community members through monitoring of rule violations. Almost all the villages, where the community institutions were functioning, had two broad kinds of rules designed by their institution. They were access rules and internal use rules.

Access Rules: The institutions designed 'rules of access' to determine who will have the rights to access the resource and who will be excluded from using it. The crafting of access rules in the villages was the most significant step in their efforts for resource protection, since it is these rules which specified the property rights and created a management regime over forest. The access rules designed by the local institutions conferred exclusive property rights over the forest to the community members and excluded the other non-members (outsiders) from having such rights.

After the establishment of community institutions and formation of access rules, the communities were able to prohibit outsiders from entering inside their protected patch of forest. The village forest protection committees had demarcated the boundaries for protection. Even though it has not been possible to separate the protected patches by fencing it, yet, no doubt there existed a social fencing inside the forest area. The members of the communities know how much forest land has been entrusted to them for management and regeneration. Further, some communities have also installed stone pillars to mark off their protected patch from the rest.

Before the formation of access rules, forests were 'open access resources' in the villages. When the protection committees were not in existence in any of the villages, the forests attached to these villages were the main source of attraction for wood contractors. People from nearby localities were also using the forest for their personal gains enormously. In fact, there was a competition in time to deplete forest resources, as depletion by one user was curtailing the chance of another to

do so. However, with the formation of protection committees and access rules, the villages were able to exclude others from entering into their forests. They kept a constant eye upon the forest thefts and illegal use by other communities. In a couple of years the use of the resource was regulated and only the members of the community upon which the management responsibility was entrusted became the sole users of the resource.

However, in the case of four villages, namely, Biradia, Ambanali, Kadua and K.K. Pur, when the protection committee became extinct around 1998 the situation became grim as members from other villages started accessing the resource. It took no time to revert the earlier situation, as was in practice before the formation of the institution. The forest became again a source of income for wood contractors. Even the villagers themselves were found to cut trees heavily from the forest areas.

Internal Use Rules: The second category of rules, which the community institutions designed in the villages, were related to sharing of the benefits of the resource and its proper maintenance. Once the resource was provided and property rights were determined, the next challenge for the communities was to design ways for proper maintenance of the resource and share the benefits out of it. During the course of fieldwork no internal use rules were observed in those four villages, where community institutions did not exist. In the remaining six villages, the institution had designed the following specific rules regarding internal use of the resource.

1. **Rule Compliance:** First and foremost, the institutions designed rules for ensuring compliance from the community members and to deal with those who do not comply with. There were provisions for punishment for those who violated rules. The punishment varied from payment of fines in cash to prohibition from use of the forest produces. Usually, none violated the rules as conformity to rules brought them a share in forest produces. The benefits from the forest have been a major incentive to obey the rules of the committee. However, it is not appropriate to conclude that only economic incentives compelled the villagers to abide by the rules and contribute to the committee for forest protection. Often the social obligations and the feeling of being together prompted the villagers to pay for forest protection.
2. **Contribution for Collective Action:** The institutions designed specific rules regarding contributions from community members towards collective action efforts. Rules for both economic and non-economic contributions were in existence in the six villages, where the institutions were present. Members of the communities contributed both in terms of cash and kind for the purpose of management. They provided free labour whenever necessary for maintenance of the resource. Besides, in certain villages, each household contributed rupees five per month, which was invested in protection activities. The community institutions of Nagia Pasi and G. Prasad formed rules to collect a minor charge of 50 paise from those who collected a head load of fuel wood from the forests.

3. **Resource Maintenance:** The community institutions of the villages were primarily responsible for protection and maintenance of the forest patch. One of the important things to ensure resource maintenance was to check thefts and illegal entrances into the forest. The institutions had well-defined rules in this regard to check forest thefts among the members of the community. In some villages, like Nagia Pasi for example, the villagers practised *Thenga pali* in the beginning to ensure protection from wood thieves and other outside appropriators.¹¹
4. **Resource Sharing:** The community institutions took utmost care to ensure that the benefits from the resource were distributed equitably among the villagers. With prior permission from the Forest Protection Committee, the villagers were allowed to collect bamboo and minor timbers for house construction or for maintenance of rooftops of the house. The institutions designed rules to give each household an equal share from the resource pool.
5. **Conflict Resolution:** Resolution of conflicts that arise at the time of management is the major challenge ahead of any community protecting forests.¹² The community institutions designed rules for such purposes, and tried to resolve the conflicts within the villages through the protection committee and imposed fines on the offender, which were also acceptable to the community members. However, the community faced challenges in dealing with the forest offences by the neighbouring non-members and commercial interests, as it did not have either social or juristic control over them. Such cases were usually referred to the Forest Department.

Differential Approach to Rules and Varying Degrees of Success

The presence of community institution to design rules for sustainable resource management notwithstanding, different communities showed different degrees of success in their efforts towards collective action. The differential collective action outcomes were observed to be directly related to the institutional factors. The ten study villages performed differently, since they approached the rules of the institutions in different manner. To gauge the relative success of these villages in collective action, the existence of community institutions to design rules of access and internal use was taken into consideration. The performance of villages in collective action was further divided into three categories: low, moderate and high.

1. **High Degree of Rule Compliance and Strong Monitoring System:** Out of the ten villages taken for the empirical survey, rules compliance and the monitoring system to punish the rule breakers were found to be strong in four villages, namely, G. Prasad, Jhankira, Nagia Pasi (N. Pasi) and Krushna Prasad (K. Prasad).

These four villages have been successful in crafting local community institutions, which could design rules regulating the access and use of the forest produces. And such rules have been backed by a strong monitoring

system, which also included assigning punishments to those who fail to comply the rules. In three cases, such as in G. Prasad, Jhankira and N. Pasi, the rules were written down in a register, below which the head of the households of the villages had put their signature. It made the point clear that rules that were created for regulating the access and use of the forest in these villages were well circulated and the members of the communities were all aware about them. Such common and shared knowledge¹³ enhances the possibility of cooperation by providing 'assurance' to one that others also know the same rules and will cooperate by showing conformity to the rules.¹⁴

The village G. Prasad was protecting its village forest of 177 acres since 1985–86, and now the village institution is a JFM Committee. In the early 1980s the village forest of G. Prasad was completely deserted and the forest land was just like a barren hill track. Since that was a village forest the state Forest Department had taken little efforts towards its regeneration. Then in mid 1980s, the villagers decided to regenerate the forest and to begin with stopped allowing grazing inside the forest area. Later the villagers undertook a massive plantation programme and now the forest stands looking evergreen. Similarly, the Jhankira village was also engaged in protecting its village forest for last 40 years. This village had the longest history of forest protection from among the ten villages taken for survey, where the protection activity started in the early 1960s. Compared to these two villages, where protection activity had been carried out in village forest areas, the villages N. Pasi and K. Prasad had taken the responsibility of protecting reserved forests attached to their villages through JFM programme. The reserved forests of these two villages were highly degraded prior to the protection by the communities, and with active efforts by these two villages the protected patch is thickly grown forest now.

Protecting the resource from the free-riders, who violate the rules for personal gain without contributing towards its protection, is definitely a challenging task before any community aiming to protect a forest patch. And the problem becomes more serious when the free-rider belongs to another community, upon whom the resource users neither have social nor legal control. However, these four villages had been successful in prohibiting both insiders and outside members of the community from breaking rules created for forest protection. This has been possible because of the personal efforts that these community members had taken to patrol the forest areas during night times. All the four villages had developed a rotation system, and accordingly, the responsibility of guarding forest was divided among the households of the communities. Currently, N. Pasi and G. Prasad had appointed a permanent forest guard from inside the village, whose responsibility is to check the illegal entrance into the forest.

These four villages were categorised as 'High Collective Action' communities, since a local institution existed for making rules for forest protection, rules were obeyed by the members of the community and finally, a

strong monitoring system existed to find out both insiders and outsiders, who tried to violate the rules.

2. **Strong Rules with a Weak Monitoring System:** Korian and Padma Lav Pur (P.L. Pur) were the two villages, among the ten, where there also existed local institutions with strong rules for forest protection. Both the villages are heterogeneous, in terms of their caste composition, with a preponderance of tribals in the P.L. Pur village. In the other village, the social composition included households belonging to several castes and a few tribal households.

The efforts towards collective action for forest protection were a relatively new phenomenon in the Korian village, which started forest protection in the mid 1990s. In these years, the village had been successful in crafting an efficient institution, which could come out with strong rules for forest regeneration. The members of the community were also found to be very much sincere in complying the rules. However, the village institution was not able to develop monitoring systems to restrict the free-riders, mostly who were members of outside community. The forest guards, which the Korian Forest Protection Committee had appointed, were able to minimise the occurrences of free-riding by members belonging to their own community. However, the institution has not been successful in prohibiting members from neighbouring villages from accessing the resource and using the forest without contributing anything. In other words, the community has been facing challenges to establish a common property regime inside the forest, since members from other communities continue to access the forest, without paying anything for their use of the resource. Similar has been the case with P.L. Pur village. Although the P.L. Pur Forest Protection Committee has been able to design strong rules for forest protection and induce its members to comply with those rules, monitoring has been a problem, especially of the outside free-riders. With their sincere efforts in forest protection over more than one and half decades, the forest area in P.L. Pur has regenerated substantially, and has become an attraction in the recent years for outside non-members to free-ride. However, monitoring the action of these outside non-members has not been successful in P.L. Pur village.

These two villages were categorised as 'Moderate Collective Action' villages, since the communities were successful enough in establishing a complete common property regime inside their protected patch of forest, having forest protection committees and strong protection rules.

3. **Non-existence of Institutions:** In the remaining four communities, namely, Biradia, Ambanali, Kadua and Krushna Kumar Pur (K.K. Pur) no functioning local institution was found during the course of fieldwork, which could design rules for forest protection. In fact, all these four communities belong to one revenue village of Krushna Kumar Pur. Even though in the government records, these four are different hamlets of one single village, yet the four communities are separate social entities having their own *jajmani*

system, around which the village economy/society revolves. The hamlet Kadua is a completely scheduled tribes settlement, with 'Sabar' and 'Juanga' tribes inhabiting in it. The rest three are heterogeneous so far as their social composition is concerned.

All the four communities started the protection activities separately in the forest patches adjoining their hamlets in the year 1993. Initially, the original K.K. Pur started the protection activity and inspired by its efforts, the other three communities also established forest protection committees. However, in these four communities even through the institutions created specific rules for forest protection, they were not complied by the members of the communities. Whatever rules the institutions created in the beginning, they were neither followed strictly, nor the institutions were capable enough in bringing out strong monitoring systems for regulating the members' non-conforming activities concerning forest use. The village Kadua was the first one where such institution became defunct due to non-conformity of rules and non-existence of a monitoring system. Gradually, the rest three also followed the same path and within 5 years, the village forest protection committees in these four communities became non-existent, and along with it the efforts towards forest protection.

These four communities were categorised under 'Low Collective Action' category, since these communities failed to establish a common property regime in the forest and did not continue their efforts for forest protection.

Discussion and Conclusion

Need for Robust Institutional Arrangements

The institutional analysis of the ten studied villages reveals the fact that only presence or absence of the institution is not always sufficient for sustainable resource management, despite being a necessary condition for it. The existing institution must be a robust one with strong rules for resource appropriation and good monitoring system. Institutional arrangements for sustainable resource management at the community level must be understood as a dynamic process, which involve a continuous interaction among the community members and the designed institution. There exists a back and forth movement between these two concerning the rules for regulating the resource use. The institution formulates the rules and expects the community members to comply such rules. The rule formation should necessarily be backed by a strong and efficient monitoring system to ensure that rules are complied, and accordingly the institution can accord positive incentive in the form of rewards to those who show conformity to rules and negative incentive through punishment to those who violate them. The institutional arrangements without a strong monitoring system fail to restrict free-ride and, hence, could not establish a well-defined property right regime over the resource.

From among the study villages, weak monitoring of rule breakings in the two communities, that is, Korian and P.L. Pur, have limited the role of the community institutions in ensuring sustainability of the forest resource (See, Table 2). The following table differentiates the villages based upon their institutional arrangements and depicts their differential performance in collective action.

Table 2. Institutional Arrangements in Study Villages

Name of the Village	Institutional Arrangements					Performance in Collective Action
	Establishment of the Institution	Rule Formulation	Rule Compliance	Monitoring		
				Insiders	Outsiders	
G. Prasad	✓	✓	✓	✓	✓	High
Jhankira	✓	✓	✓	✓	✓	High
Nagia Pasi	✓	✓	✓	✓	✓	High
K. Prasad	✓	✓	✓	✓	✓	High
Korian	✓	✓	✓	✓	×	Moderate
P.L. Pur	✓	✓	✓	✓	×	Moderate
Ambanali	✓	✓	×	×	×	Low
Biradia	✓	✓	×	×	×	Low
Kadua	✓	✓	×	×	×	Low
K.K. Pur	✓	✓	×	×	×	Low

Source: Field Survey.

Role of Community Institutions

The existence of institutional arrangements in six out of ten study villages was very much crucial with respect to sustainable use and management of the local forest resource. To conclude, we may deduce that the community institutions had played the following important roles, which helped certain communities succeed in collective action efforts, while others failed in it. The important role of the community institution in collective action for sustainable common pool resource management is depicted in the following diagram, and is further elaborated in the following (see Figure 1).

1. The institutions, where they existed, had ensured equitable distribution of benefits out of the common property. As discussed earlier, the institutions designed rules and regulations as to who can use the resource, when and how much resource units each member can derive. By designing rules for equitable sharing of the benefit out of the resource, the institutions solved the appropriation problem of the resource users.
2. The presence and well functioning of the institutions defined property rights over the resource and established common property regimes in the

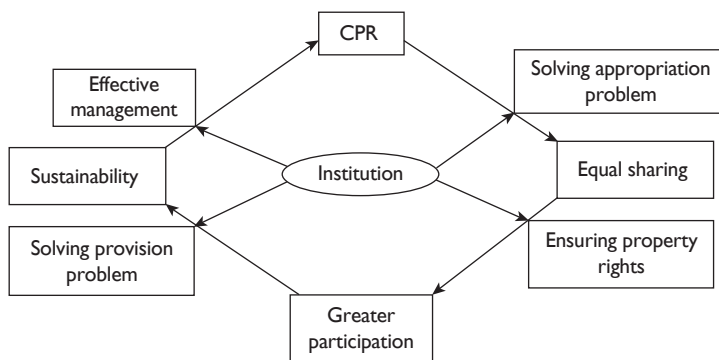


Figure 1. Role of Institution in Sustainable Common Pool Resource Management

Source: Author's Own.

forests. When institutions were formed for forest protection, the members of the communities got property rights over the resource, which they shared among themselves within the community. Confirmation of property rights and an ensured equitable share in the benefits generated a sense of responsibility for the maintenance of the resource among the community members. With the establishment of common property regime, restriction of free-riding and proper maintenance of the resource, the community institution solved the 'appropriation problem'.

3. With equitable sharing of benefits through the institution, all members of the community got equal access to the resource and as a matter of principle contributed for its maintenance. By giving access to the resource through property rights arrangements, guaranteeing an equal share over the benefits and demanding contributions from the users of the resource, the institution ensured the participation of all members of the community in the management of the resource. When the members visualised the benefits of collective efforts they participated actively by physically guarding the forests from any kind of offence.
4. Finally, with greater participation, guaranteed share in the resource, demand for contribution for maintenance, the institution worked towards sustainability and effective management of the newly evolved common property regimes in the villages.

Acknowledgement

The author would like to thank Prof. G.K. Karanth of Institute for Social and Economic Change (ISEC), Bangalore, Dr. Sharad Lele of Center for Interdisciplinary Studies on Environment and Development (CISED), Bangalore and

Dr. Pratyusna Patnaik of Council for Social Development (CSD), Hyderabad for comments on the article. The fellowship provided by ISEC, Bangalore for the research is duly acknowledged.

Notes

1. The term 'collective action' in social science literature has been widely used by different scholars to understand different situations. However, the element, which is common to all, is 'mutual interest and the possibility of benefit from coordinated action'. Situations requiring collective action take several forms, one of which is the management of common property resources like fisheries, forests and irrigation. Although sociological literature on the subject is relatively small and new (for example, Heckathorn, 1988, 1989, 1990, 1991, 1992; Marwell and Oliver, 1984, 1993; Oliver, 1980; Oliver, Marwell and Teixeira, 1985), research on the subject by economists (for example, Bator, 1958; Head, 1974; Olson, 1965; Samuelson, 1954), political scientists (for example, Chamberlin, 1974; Frohlich and Oppenheimer, 1970; Hardin, 1971) and psychologists (Bonacich, Shure, Kahan and Meeker, 1976; Dawes, McTearish and Shaklee, 1977; Kelley and Grzelak, 1972) is much too large and old.
2. Resource appropriation in CPR means withdrawal of resource units by resource users from the whole resource system. Resource users may appropriate resource units for self consumption, for using it as an input for production process, for example, water for agricultural development, or for the market (Ostrom, 2001: 142).
3. In the case of forest management, while the provision problem relates to regeneration and maintenance of the forest area, the appropriation problems are related with equitable distribution of forest produces among the forest users.
4. For a detailed understanding of the factors essential for collective action, see Wade (1988), Ostrom (1990) and Baland and Platteau (1996).
5. On certain occasions there arise differences between formal laws and working rules. In such cases, working rules may provide *de facto* rights over a resource that are contrary to *de jure* rights provided by formal laws. The whole discourse of legal pluralism addresses these issues (see, Rout, 2005). However, Ostrom concentrates only on *de facto* rights that are actually used in CPR settings.
6. In fact, prior to Ostrom, Commons (1957) used the term 'rules in use' or 'working rules', which are those actually used, monitored and enforced when individuals make choices of taking certain actions.
7. Ciriacy-Wantrup and Bishop (1975) makes a further distinction between an open-access CPR, in which any firm property right does not exist and none claims such rights, and a closed-access CPR, in which a well-defined group enjoys property rights over the resource through their institution.
8. McKean considers that when a common property is combined with a well-defined institution, user group and property rights, it becomes a 'shared private property' (see, McKean, 2000).
9. Common property regime is distinguished from other three kinds of resource management regimes: state property regime, private property regime and open access. In the case of state property regime, the property rights (ownership) over the resource remains with the state, which controls it by its agencies like government.

The resources under private property regimes are owned, managed and used by private individuals. Open access is a situation where property rights arrangement does not exist at all and hence, none (neither individual/s nor community) can claim exclusive right over the resource.

10. Property rights over the forest land determine the difference between different types of forests and accordingly, their legal status. In Orissa, forests are divided into three categories: reserved forest, protected forest and village forest. While in the case of reserved forest, the Forest Department enjoys property rights over the forest land, in protected forests, the management rights and responsibilities of the forest are conferred on Forest Department, whereas the property rights on land remain with Revenue Department. The management responsibility of the village forests is supposed to be vested with the local communities as per the Government of Orissa Village Forest Resolution, 1985.
11. *Thenga pali* (which can be translated as stick rotation in English), a voluntary monitoring system, in which a wooden stick, *thenga*, their symbol of protection, is passed on from house to house making a symbolic transfer of responsibility of forest protection. Every household after fulfilling the task of watching, passes on the stick to the next household, whose turn it is to watch the forest the following night. The household that receives the stick is responsible for getting members of the other four households to join them when they proceed to the forest.
12. There are mainly four potential sources of conflict that may arise in any community managing forests: (a) conflict among the community institution's members, (b) conflict with neighbouring non-members, (c) conflict with other external commercial and industrial agents and finally, (d) conflict with the state, primarily with the Forest Department (Sarin, 1996).
13. Elinor Ostrom (1990, 2001) also regards common knowledge as one of the important characteristics of 'working rules'.
14. The Game Theoretic Approach deals with the 'problem of assurance' in a common pool situation, and discusses how the resource users become assured of each others' cooperation. For details, see Axelrod (1981), Bardhan (1993) and Rasmussen and Meinzen-Dick (1995).

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