

**PROPERTY RIGHTS AND NATURAL RESOURCES: IMPACT OF COMMON
PROPERTY INSTITUTIONS ON COMMUNITY-BASED RESOURCE MANAGEMENT**

(Research Proposal on Impact of CPR Institutions on Community-Based Forest Management in Nepal)

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1. INTRODUCTION

Ever since the publication of Hardin's articles 'The Tragedy of the Commons' there has been a growing debate on common pool resources, property rights, and resource degradation. The concept has been used to explain overexploitation of forests and fisheries, overgrazing, air and water pollution, abuse of public lands, population problems, extinction of species, and other problem of resource misallocation (Stevenson, 1991). When property rights to natural resources are absent and unenforced i.e. when there is open access, no individual bears the full cost of resource degradation. The result is 'free riding' and over exploitation, what Hardin termed the 'Tragedy of the Commons' (Hardin, 1968). It was thought that a resource held under a common property resource (CPR) regime is inherently inefficient since individuals do not get proper incentives to act in a socially efficient way. The main goal of managing natural resources is to maximize the long-term economic rent. Until recently many scholars believed that community-based management generates little or no rent due to absent of proper management. As a consequence scholars have long questioned the incentive for efficient use of common pool resources under CPR regime (Gordon, 1954; Scott, 1955; Hardin, 1968) and solutions have been proposed, such as state control and management (Hardin, 1968) or privatisation of the commons (Demsetz, 1964). The property rights school argues that private property is the most efficient way to internalise the externalities that arise in former cases. It also makes the contention that private property rights will spontaneously emerge in reality to increase efficiency (Demsetz, 1967).

An increasing number of scholars, however, advocate that decentralized collective management of CPRs by their users could be an appropriate system for overrating the 'tragedy of commons' (Berkes, 1989; Wade, 1989; Jodha, 1986; Chopra et al. 1989; Ostrom, 1990, 1994). More careful analysis of the foundation of CPR regimes in developing countries have shown that local institutional arrangements including customs and social conventions designed to induce cooperative solutions can overcome the collective action problem and help achieve efficiency in the use of such resources. (Gibbs and Bromley, 1989; Ostrom, 1990). Scholarship on the commons argued that Hardin confused common property with open access, failing to distinguish between collective property and no property (Ciriacy-Wantrup and Bishop, 1975). Even the common grazing lands in Hardin's classic 'Tragedies of the Commons' were well looked after for many centuries, before they declined for reasons unrelated to any inherent flaw in the commons system (Cox, 1985). The tragedy tends to be related to the breakdown of existing commons systems due to disruptions that have originated externally to the community (Berkes, 1989). Hardin's tragedy of the commons often results, not from any inherent failure of common property, but from institutional failure to control access to resources, and to make and enforce internal decision for collective use. Institutional failure could be due to internal reasons, such as the inability of the users to manage themselves, or it could be due to external reasons, for example an incursion of outsiders (Dove, 1993; Berkes and Folke, 1998). Failure could also occur as a result of factors such as population growth, state intervention, market penetration and introduction of new technology. Notwithstanding different views and debates on the efficiency of resource utilisation under common property rights regimes, it is generally agreed that resource management under common property institutions is the most viable option for a long term economic and ecological sustainability of the commons.

The recognition of community-based resource management leads to the devolution of natural resources from centralized government management to local user groups in Nepal and other South Asian countries. Devolution of forests has been underway in Nepal since 1990s under which national forests are handed over to forest user groups (FUGs) under a community-based property rights regime. The Government has been issuing policy initiative for encouraging participation of rural households to strengthen community-based institutions for the control and sustainable management of local forest resource. FUGs are granted with usufruct rights to forest through legal enactment. User groups are being encouraged to become independent and self-governing organization, and be fully involved in preparing plans, harvesting, and sharing the benefits. So the devolution of authority to groups of forest users to manage forest resources is the main operational strategy for the community forestry program in Nepal. To date more than 9000 FUGs are managing about 660,000 hectares of community forest in the country (CPFD Database, 2000). Similarly, Joint Forest Management (JFM) has been initiated in India since the late nineties for involving local people in forest management and envisaged a formidable partnership between the people and state government to protect and regenerate forest while meeting people's needs in sustainable manner. This shift in policy is no more than a belated recognition that sustainable resource management can never be independent of sustainability of collective human institutions that frame resource governance, and that local users are often the ones with the greatest stakes in sustainability of resources and institutions (Agrawal, 2001).

Although local control over natural resources is now regarded as a win-win solution for government, local people and the environment, the empirical evidence regarding the impact of common property institutions is rather thin. There is still insufficient solid empirical knowledge about the evolution and functioning of local NRM institutions and how government and donor interventions can shape the process (Heltberg, 2001). Current debates on community forestry in Nepal focus on the following questions: What makes some systems of community-based forest management more successful than others in sustaining the resource and distributing its products? What production processes are taking place and what contribution do they make to the income of poorer households? What are the community and household characteristics that promote inequitable access to and control over resources and local institutions? What are the local economic consequences of CPR management institutions? How do community-based property rights over forests affect the livelihood strategies of the poor? Though there is extensive literature on success of CPR system in conserving local resources, empirical discussion regarding the interplay between poverty, institutional change, and distributional implications of CPR management is not properly settled. A striking feature of most of these studies lies in the fact that their authors are generally convinced that, given the glaring failure of state ownership experiences in developing countries, collective, community-based regulation holds out the best prospects for an efficient management of village-level natural resources (Baland and Platteau, 2001). However, they recognise at the same time that the balance sheet of actual experience of common property option is rather mixed; the central focus on the research should be directed towards understanding the reasons that can account for these varying levels of performance of CPR institutions. It is also not clear upon what condition resource management will be optimal to ensure equity and efficiency among the resource users. Further research on determinants and impact of local management institutions and thus performance of CPR management is emphasised mainly in relation to distributional implication of the regime, decision-making arrangements and the way individuals interact when applying rules (co-operation, free riding etc.) and an analysis of the outcome

(efficiency and equity). So far systematic tests of the relative importance of factors important to sustainability, equity, or efficiency of common property institutions are relatively uncommon (Agrawal, 2001). A clear understanding of the local management institutions, their determinants and their role in shaping the environmental outcome is desirable to better guide future NRM policies (Heltberg, 2001). In this study, we therefore intended to explore the determinants and impact of local management institutions and how local level heterogeneity among resource users influences the emergence of productivity enhancing institutional arrangements and thus resource management regime at the local level.

2. LITERATURE REVIEW

Recent literature on CPR management criticized “Hardin’s Tragedy of the Commons” often results, not from any inherent failure of common property, but from institutional failure to control access to resources, and to make and enforce internal decisions for collective use. These critiques argue that Hardin's tragedy of commons' is applicable only to the situation of appropriation of 'open access resources' and not to commons i.e. common property resources (Ciriacy-Wantrup and Bishop, 1975; Bromley and Cernea, 1989). In case of open-access and unregulated common property individuals do not get proper incentives to act in a socially efficient way. In the literature of common property broadly three different schools of thought have emerged on the institutional arrangements to avert the tragedy of commons. According to property rights school the problem of over exploitation and degradation of common property resources (CPRs) can be resolved only by creating and enforcing private property rights (Demsetz, 1967; Johnson, 1972; Smith, 1981; Cheung, 1970). Private property is considered to be the most efficient way to internalise the externalities generated from over exploitation of the commons. The scholars of second school of thought advocate that only the allocation of full authority to regulate the commons to the external agency i.e. state property regime can reduce the over-exploitation of CPRs (Hardin, 1968). Institution building at the community level for managing common-pool resources has emerged as a third possibility. An increasing number of scholars advocate that decentralized collective management of CPRs by their users could be an appropriate system for overrating the 'tragedy of commons' (Berkes, 1989; Wade, 1987,1988; Jodha, 1986; Chopra et al., 1989, Ostrom, 1990). Ostrom (1990) argues that collective action for CPR management will be long enduring and successful under conditions of well-defined boundaries, congruence between appropriation and provision rules, graduated sanctions, efficient conflict-resolution mechanisms and effective monitoring.

Some recent literature, however, argues that property rights by themselves do not provide adequate incentives and conditions for sustainable management. Appropriate cost-benefit sharing arrangements, together with empowerment of resource users, technical assistance to develop and strengthen local organizational capacities, and support equitable and sustainable management efforts are examples of other essential elements. The success of the property rights regime depends upon the congruence of ecosystem and governance boundaries, the specification and representation of interests, the matching of governance structures to ecosystem characteristics, the containment of transaction costs, and the establishment of monitoring, enforcement and adoption processes at the appropriate scale (Eggertsson, 1990; Ostrom, 1990; Bromley, 1991; Hanna, 1992; Hanna and Munasinghe, 1995). While the aggregate gains from reducing common pool problems or promoting economic growth through the definition or redefinition of property rights are unlikely to be

controversial, the distribution of wealth and political power inherent in the proposed rights structure will be a source of dispute (Libecap, 1989). Restricting the access of poor people to natural resources through changes in property rights structure in common-pool resources is likely to increase the level of poverty unless specific measures of compensatory transfer schemes are in place to safeguard the interests of the most vulnerable section of the community. There seems no reason to suppose a priori that institutions are always efficient and equitable and they serve the purpose that the institutions were created for.

Consistent with growing theoretical literature, there is enough empirical research in India dealing with commons and the dependence of poor on the CPRs (Chen, 1991; Pasha, 1992; Jodha, 1985a, 1985b, 1986, 1990, 1995; Iyengar, 1997, 1989; Beck and Ghosh, 2000; Beck, 1994, 1998; Agarwal, 1991, 1995, 1997; Singh et al., 1996; Iyengar and Shukla, 1999). Jodha observed that rural poor are heavily dependent on CPRs for their livelihood. In a study of 21 districts of seven States of India he found that the privatisation of CPRs as a strategy to help the rural poor yielded a negative results and also reduce the productivity of the commons. Iyenger (1989) in his study of Gujarat, India has observed that it is the population pressure induced privatisation that is mainly responsible for the degradation of CPRs. Chopra et al. (1989) in their study of Hariyana highlights the importance of participatory management in controlling the CPRs. They argue that government's failure to preserve CPRs together with their excessive exploitation for developmental activities has led to serious degradation of the environment with ecological repercussions. In a similar study in North Western Himalayan region, Singh and Ram (1997) argue that the success of a strategy for CPRs often depends upon local participation and institution. Though assessing the impact of CPR institutions on environmental sustainability is extremely difficult, Meinzen-Dick et al. (1997) noted that property rights affect the time horizon for resource use, and incentive for conservation, as well as for investment in improving the resource. Most of these literature emphasized that efficient institutional arrangements are very important in many common property resource management systems to ensure equity and sustainability of resource management at the local level. Gibbs and Bromley (1989) noted that a well functioning common property regime will probably be distinguished by i) a minimum (or absence) of disputes and limited effort necessary to maintain compliance, i.e. the regime will be efficient; ii) a capacity to cope with progressive changes through adaptation, such as the arrival of new production techniques, i.e. the regime will be stable; iii) a capacity to accommodate surprise or sudden shocks, i.e. the regime will be resilient; and iv) a shared perception of fairness among the members with respect to inputs and outcomes, i.e. the regime will be equitable.

CPR institutions serve a number of important economic functions like coordinating the formation of expectation, encouraging cooperation and reducing transactions costs. The importance of transaction costs in any economic exchange is highlighted by many scholars (Coase, 1960, Williamson, 1975, 1985; Cheung, 1983, North, 1990). Some economic and social science literature emphasises that homogeneity or heterogeneity among agents in any society reflects the levels of trust, which influences the emerge of local management institutions through it's impact on costs of transactions. Transaction costs associated with trading are reduced by an increase in levels of trust between trading partners and the development of institutions that provide incentives for lasting cooperation (Coleman, 1988; North, 1990; Ostrom, 1999; Woolcock, 1988). Zak and Knack (2001) posit that heterogeneous societies, especially those with weak formal and informal institutions, have lower trust and retarded economic performance than less heterogeneous, higher trust societies. Nonetheless, in many empirical studies, physical input and property rights are

taken as variables and transaction costs of resource management seldom incorporated in the 'price' of resource consumption, though they can be a significant component of resource use. It has been reported that transaction costs of community-based forest management are significantly higher for poorer users (Richards et al., 1999). In many cases, benefits from resource management are exceeded by management costs (Hanna, 1995). A common property regime would not have the need for extensive records on boundaries and sales, but instead require meetings and discussions where the co-owners decided their strategies for the coming period (Bromley, 1991) which constitute a significant portion of management costs. Most of the recent literature on heterogeneity and collective action presume that socio-economic differentiation and group heterogeneity makes cooperative arrangements more difficult and innovation of local management institutions becomes impossible due to high transaction cost.

Though the management of CPRs and its implication to environment and poverty has been well studied in India, no systematic effort has yet been undertaken in Nepal this regard. Some of the studies have only touched upon the issue of CPRs and role of common property institutions in regulating the access and conservation rules (Springate-Baginski et al., 2000; Malla, 2000) but no comprehensive effort has been made to integrate the impact of local management institutions on rural local livelihoods and sustainability of common property resources at the community level. Moreover, most of the previous studies (both in Nepal and India) do not explicitly analyse the equity of resource distribution within the community. Very few studies on equity and distributional implication of CPR institutions exist. McKean (1992) argued that entitlement to products of the commons varies to a surprising extent. Hill and Shields (1998) observed that the community incentives in JFM in India are not so clear-cut, however, the main losers in JFM are fuel wood head loaders who are often from the poorest subgroup within the village. Ribot (1995) for Senegal and Andersen (1995) for India report how wealthy and influential villagers in control of supposedly democratic forest councils are able to use state resource laws to their personal benefit and to the detriment of the poorer and powerless resource users.

The assertion that institutions are always optimal is ludicrous when confronted with reality. Institutions created by man are not always optimal, efficient and egalitarian. Without careful empirical analysis (which is rare) functionalist explanations may become justifications for irrational or non-functional institutions (Bates, 1995). There seems no reason to suppose a priori that competitive pressures are always sufficient to break up less than optimal institutions (Basu et al., 1987). Institutions do not always decrease transactions costs but might actually, when they are inefficient, increase transaction costs (Olsson, 1999). Based on review study on CPR management in Zimbabwe, Campbell et al. (2001) argue that there is a fair degree of misplaced optimism about CPR institutions since the formal rule-based system that form the cornerstones of CPR management are gradually replaced by donor-assisted intervention rooted in norm-based controls. North (1990) pointed out that not all institutions are efficient and powerful groups to serve their particular interests can capture institutions of collective action. In addition, it may be the richer members of the community that dominate local politics and organizations as found in JFM in India where benefits from the system goes to certain sectors of the community (Saxena, 1989). Understanding the determinants and impact of common property institutions and distributional implication of CPR regime is essential for informing forest policies and programs in Nepal and other South Asian countries where much policy emphasis currently is being placed in promoting community-based institutions for forest resource management and poverty reduction through better management of the commons.

3. PROBLEM STATEMENT

Property rights structures over natural resources in general and local forest resources in particular have been frequently changing over time in Nepal. These changes are associated with exploitation and degradation of mountain forests and its biological diversity. Various legislative measures were enforced to ensure clear ownership over the forest. The major policy change has occurred in 1990 by which forest management authority was granted to community level organization under community-based property rights regime. The Forest Act (1993) vests more legal authority in the forest user groups so that they may manage the community forests on a sustainable basis. This legislation was given greater coherence by the Forest Rules 1995, which further clarified the powers and duties of Forest User Groups. As per these policies, local communities are organised as FUGs and accepts the responsibility for protection, management and sustained utilization of forest areas under community-based property rights regime. To date more than 9000 FUGs are managing about 660,000 hectares of community forest in the country (CPFD database, 2000).

However, despite having the most innovative policies to promote community-based resource management in place, CPR institutions are said to be unable to provide a significant contribution to the livelihood of poor and marginalized people due to their failure to take into account broader socio-economic and distributional issues. Although improvement in the physical situation of forest and trees resources on both public and private lands have been reported (Branney & Yadav, 1998) equitable use of forests products such as fuel wood, fodder, timber and other non-timber forest products within the community has not been clearly demonstrated. Poor users are not actually benefiting when all opportunity costs are accounted for in the assessment of costs and benefits of forest management. There are some cases that people who could not contribute the costs of resource management have given up their participation. Some households belonging to particular income groups especially the poorer ones have even been affected negatively. The poor and disadvantaged were found to have felt difficulty because of equal responsibility among all participants, and the necessity to work more and more but having no gain. The landless, and households belonging to particular ethnic groups like blacksmiths, and other politically and economically marginalized people are not able to take advantage of incentives for tree growing. The amount of forest products harvested at present is insufficient to meet the needs of the users and the process involving the distribution of these products (like auction, contracts, free distribution and equal distribution) favours the wealthier households (Malla, 2000). Questions thus remain, about how widespread and equitable such common property institutions are (Hobley, 1996). Previous research on community forestry was confined to the allegedly value free efficiency condition claiming that questions involving the distribution of benefits are matters for the political process (Grand and Robinson, 1984). Unless distributional issues are resolved in a proper way the production part of the forest management could be paralysed, and hence there would be no efficiency (Byron, 1991).

Various authors noted that recent policy shifts have not helped needy people, but often have worked to their disadvantage. They are often not included in the users committee which influences forest management, and so they have now lost even their traditional access to forest resources, as fuel wood sellers and livestock herders are not effectively represented in the operational regimes. Elites and traditional decision-makers often dominate the users' committee. Marginalized and poor people are usually neglected during the planning and operational plan preparation that undermines their role and excluded them

to getting a fair share of forest products. The limitations on fuel wood collection have a more profound impact on households whose livelihood is traditionally closely linked to its collection. The most obvious group thus affected are fuel wood sellers, who now have to either go much further afield or find alternative means of livelihoods. It also affects others, such as raksi (a local liquor) makers and blacksmiths, both of who need large quantities of fuel wood (or charcoal) in their trade (Soussan, 1998). A priori, one would expect the CF restrictions to have had less impact on the wealthier groups, since, with more private land to satisfy their own requirements, they were less dependent on the national forest area (Richards et al. 1999). Very few FUGs make any special provision for these groups, who find their livelihoods jeopardised by the introduction of community-based management regimes. While FUG management has led to a marked improvement in the forest condition, the concern is that this is at the expense of welfare or equity objectives (Branney and Yadav, 1998). A wider understanding of the ways in which poor women and men systematically gain access to CPRs can help inform development interventions by building on institutions already in place (Beck and Nesmith, 2001).

Analysis of the impact of community-based institutions in managing common pool resources is becoming a central issue since management objectives and the nature of dependency on common property resources is somewhat different for different income groups. The distributive consequences of management institutions might not be only a crucial determinant of the extent of resource utilization but also an indicator of the level of poverty. With the expansion of community-based management regime, a question of equity in sharing the benefits from, and costs of, participatory forest management has been emerging more acutely than ever before. Who controls and manages the forests? Who makes decisions? What is the size and nature of benefits, and how they are distributed among the various sub-groups within a community? How will women and the disadvantaged section of the society be empowered to address their social and political constraints? These are the completely unanswered questions, which need to be properly addressed to give a new direction for participatory forest management. However, in the context of participatory forest management in South Asia, there is a tendency to assess the impact of community-based resource management in terms of biophysical change rather than impacts on villager's livelihood. The major questions still to be answered are how great are the real costs and benefits of participation, and how they are distributed amongst the various actors (Hobley and Wollenberg, 1996). There is less attention to the fact that poorer households might not be better off at all from changing the property rights institution unless specific measures of compensatory transfer schemes are in place. The more ambiguous nature of community-based property rights regime on distributional grounds, therefore, points out the need for further research to include specific measures to safeguard the interest of those who may lose from community-based resource management regime, especially as they are often the poorest and most vulnerable in the community. The success of natural resource management (NRM) depends upon the local capacity for collective action, but the factors that encourage or inhibit the collective action are insufficiently understood (Ramsussen and Meinzen-Dick, 1996). Theories purporting to explain institutions functionally fall short by failing to consider inertia, friction, vested interests, agency and collective action problem – in sum, the role of history and politics is ignored (Heltberg, 2000). The relevance of common property institutions must be tested by examining institutions that have emerge locally and formed with external assistance and which are vulnerable to fluctuating markets and other aspects of the broader political economy of the region in which they operate (Morrow and Hull, 1996).

4. STUDY GOAL

The main objective of this study is to investigate the local level formal/informal management institutions, their determinants and their impacts on collectively owned natural resource management. It will shed light on how property rights institutions shape the individual's action and expectations and their use of natural resources and its implication on equity, efficiency and sustainability of the commons. The specific objectives are;

- 1) To examine the determinants of local management institutions and analyse its impact on the effectiveness and sustainability of forestry resources at the local level
- 2) To analyse the economic consequences and thus equity and distributional aspects of CPR management regimes
- 3) To examine whether there is significant relationships between local level heterogeneity and emergence of community-based natural resource management institutions
- 4) To draw conclusion about socio-economic impacts and livelihoods implications of community forest management on different stakeholder groups in which it is implemented

5. RESEARCH QUESTION

This study seeks to understand how common property institutional arrangements can result in efficient use, equitable allocation, and sustainable conservation of common-pool resources. The main argument of this study is that what makes social systems of common pool resource management successful in sustaining the resource and distributing its benefits to the community members that affect institutional durability and long-term management of forest resources at the local level. This study specifically addresses the following questions;

- 1) What are the institutional mechanisms that govern the access to and use of forest resources?
- 2) What are the determinants of local management institutions? How institutions affects successful forest outcomes?
- 3) What are local economic consequences (equity and distributional issues) of local level CPR institutions?
- 4) Does local level heterogeneity (physical attributes of resource and both economic and social heterogeneity among resource users) obstruct the evolution of productive and egalitarian institutional arrangements at the community level?
- 5) What are the additional institutional options that ensure increasing access of the poorest community members to local CPR that ensure equitable and efficient forest management outcomes at the local level?

6. METHODOLOGY

6.1. Theoretical Framework of Analysis

The study explores the role of CPR institutions on community-based common-pool resource management. The basic purpose is to explain the formation of local institutions and its impact on management of environmental resource at the local level. Our methodological approach builds on insights from 'new institutionalism' and theoretical and empirical literature from new institutional economics that underscore the role of formal and informal institutions for solution for the of common-pool resource problems. The theoretical framework underlying this study will be based on institutional approach to resource management. The perspective on institutions adopted here follows the approach of North (1990), who defines institutions as humanly devised constraints that shape human interaction that ultimately affects the performance of economy by their effects on the costs of exchange and production. In the context of common-pool resource management, institutions can be more specifically defined as a set of accepted social norms and rules for making decisions about resource use: these defines who control the resource, how conflicts are resolved, and how the resource is managed and exploited (Richards, 1997). The problem of environmental degradation from the economic perspective is to get the institution right. The underlying causes of environmental degradation will be found in those problems that systematically result in institutional failures. The basic theme of economic reasoning in the domain of institutional changes is that the propensity to achieve equity and economic efficiency in the allocation of resources. An institution established to achieve such an objective remains in place as long as it serves the purpose. Whenever the underlying economic relations change, common property institutions will have to be more evolutionary in nature in response to underlying economic circumstances of the community.

In order to explain the impact of CPR institutions on NRM management, the relationships between the community level variables need to be explicitly defined. The relationships between these broad categories of variables are presented in Figure 1. This framework guides our empirical analysis, which draw on household cross-sectional data from 30 different forest user groups and 600 households in the middle hill of Nepal. The physical characteristics of resource include area of forest, type and species composition, which determine the productivity of the resource system. By physical attributes of resource we mean the state of the resource such as levels of scarcity, size of the resource system and the natural boundness of the resource. Wade (1987) points out a positive relationship between resource scarcity and collective action. However, Bardhan (1993) argue that institutional arrangements are likely to break down at ecological stress and high level of resource scarcity. Regarding population growth, Dasgupta (1995) hypothesized that higher growth rate negatively affects the likelihood of collective action. Population growth is assumed to be responsible for degradation of CPRs, both directly as more users exploit limited and imperfectly managed commons, and indirectly through worsening poverty and disruption of management institution (Heltberg, 2001).

Characteristics of user groups focus both on social and economic attributes of households and community such as group size, assets holding and income inequality, ethnicity, proximity of the resource users and the location of resource, which we consider source of heterogeneity. Olson (1965) considers that smaller the group size, greater the likelihood of collective action. Ostrom (1986, 1992) claims that heterogeneity in asset structure can

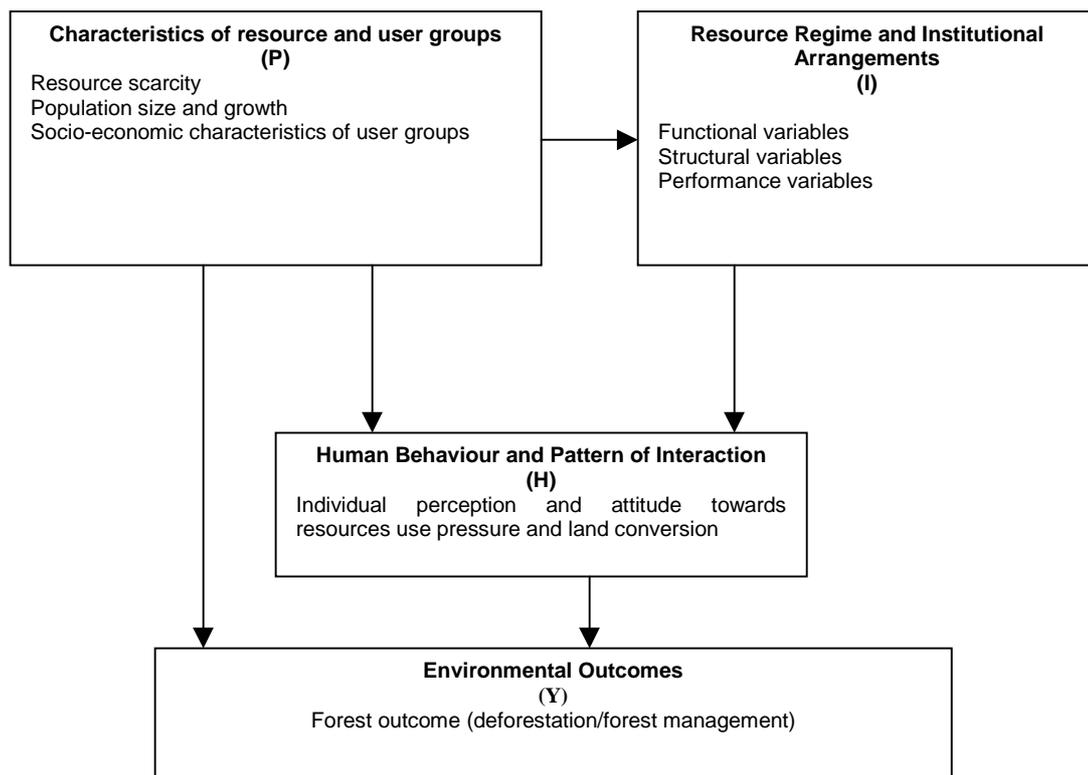
actually favour the possibility of collective action, especially where there are a need for leadership and entrepreneurship. We treat all these variables as the exogenous variable of our model, which determine the local level NRM management institutions, and institutional arrangement of collective action. Physical attributes of resources and socio-economic characteristics of user groups together with institutions and resource regime are said to be responsible for shaping human behaviour in respect to resource management or exploitation. Participants react differently according to the incentives and constraints inherent in the situation. Strategic interactions among participants in an action situation produce different outcomes (Tang, 1991). Human behaviour -through the use pressure and land conversion- together with physical characteristics of resource determines successful forest outcomes. In order to explain these relationships, we will adopt the model developed by Heltberg (2001), which can be represented by following basic static framework in semi-reduced form:

$$I = f \{P\}$$

$$H = f \{P, I\}$$

$$Y = f \{P, H(P, I)\} = f \{P, I\}$$

Figure 1: Conceptual framework for analysing determinates and impact of local management institutions in natural resource management



Source: Heltberg (2001) and Own Representation

We further assume that attributes of the institutional arrangements consist of three sets of variables such as functional variables, structural variables and performance variables. Functional variables include operational rules, which directly affect the use of the resource like input rules, allocation rules, monitoring and sanctioning rules, incentive structure,

finances and penalties in case of rule violation. It also includes technology to be used or tools that can be used in harvesting and collecting forest products. Structural variables refer to nature of collective choice rules which consists of information about structure of the Forest Users Committee (a decision-making body), decision-making process, mode of representation in decision-making body, and social- and economic status of its leaders. Veto rights to certain individual or groups are an example of such collective choice rules (Oakerson, 1992). The performance variables include the size of private benefits from community forest, increased stock of trees, species composition, increased income of households from resource management and nature of access to forest for different categories of resource users. We will take into account all these variables when examining whether or not there is presence of formal or informal management institutions in particular village in our research site. Efficient management of common property resource management is often challenged by various sources of uncertainty that result in high transactions' costs of overall resource management and these costs are directly related to management effectiveness and efficiency of a common property institution.

We will estimate three different econometric models. First model will be logit regression for determinants of local management institutions, in which endogenous variable (management institutions) will be a dummy variable. This will take a value of 1 in those villages where there is a presence of management institutions. We hypothesized that institution for collective action is a function of physical and technological characteristics of resource and socio-economic characteristics of user group. The endogeneity of the variable *I* will be taken into consideration during econometric estimations. Dependency of household on community forest will be estimated in second regression model where household's dependency on forest (use pressure) is measured in terms of use of various forest products by rural households. In this model, we assume that household dependency on forest resource (use pressure and land conversion) is a function of both characteristics of resource and user groups and local institutional arrangements. For the third model, we will develop forest management index (endogenous variable), which capture the quality of the vegetative cover and extent of deforestation. For this model, explanatory variable will be characteristics of resource and users as well presence or absence of formal/informal management institutions as measured by dummy variable. We will draw heavily from our on going research in which we are undertaking economic analysis of household use of community forest to understand economic consequences (equity, distributional and transaction costs issues) of local management institutions. We plan to integrate our on going research into this proposed study, which form the final version of our research findings. This will advance our understanding on: a) determinants of institutions for collective action, b) their impact on forest outcomes, c) their distributional implications and, d) how heterogeneity/inequality among rural households enhance/exhibit the evolution of productivity enhancing governance structure at the local level.

6.2. Site Selection

We will select three districts i.e. Dolkha, Kavrepalchowk and Sindhupalchowk districts of the mid-hills of Nepal because these are the typical hill districts where participatory forest management has been implemented for almost two decades. A total of 30 FUGs will be selected for the study. Approximately, a total of 600 households will be surveyed. Since we are looking at institutions from a formal property rights perspective, FUGs selected for this study will be based on four criteria: (a) FUGs officially handed over to the community at least five years before this study (b) FUGs with various forest types representing the

different mix of forest products found in the middle hills of Nepal (c) FUGs at the stage of substantial harvesting and benefit sharing, and (d) FUGs representing different stakeholder groups i.e. income groups representing the rich, middle wealth and poor categories of forest users. Besides this, FUG will be selected representing different levels of performance and altitude and geographical condition of the study sites.

6.3. Field Research Activities

Stage 1. The first stage of research will consist of the following activities;

- Literature review will be undertaken on empirical studies of institutions and common property resource management
- Household structural questionnaire survey will be prepared, and research design will be conceptualised
- Planning and arrangement of the field study

Stage 2. Visit to Nepal: A total of twenty-four weeks is allocated for field research. About four weeks will be spent on Kathmandu for activities listed below;

- Three local researchers, one economist, one sociologist and another forestry graduate, will be recruited for the duration of three months. The local researcher will help in designing sample and household survey, and collecting primary and secondary data.
- Collect specific research material available in Nepal
- Formal and informal discussion with government official, international conservation organization and local NGOs working on CPR management
- Fifteen Village Development Committees (VDC) will be selected in which community forestry programme is being implemented for at least last 5 years. Two forest users groups from each VDC will be selected for the study. Therefore, a total of 30 forest users group will be selected
- Final field visit planning and preparation

Stage 3. Field visit scheduled for a twenty-week period. It is estimated that it will be possible to conduct 600 household surveys over the period of four months using the two-survey team. The following tasks will be performed under this research phase.

- Wealth ranking exercise will be carried out to identify the factors, which the community defines as important in the categorization of the socio-economic position of households, and to assign individual households to ranks identified. All user households will be divided into three different stakeholder groups: poorer households, middle wealth families, and richer/wealthier households
- Sample households will be stratified on the basis of wealth ranking. A minimum sample of 20% of households in each stakeholder group will be sampled.
- The questionnaire will be pre-tested before the main survey with small 'focus' groups to discuss their reactions to questionnaire prior to detail survey.
- Administer household survey

Stage 4: After fieldwork, about four weeks will be spent in Kathmandu. This provides opportunity to;

- Share the initial findings with knowledgeable local experts
- Complete informal visit and discussion that was not complete before field visit
- Gather remaining secondary information to be collected from Katmandu

6.4. Data Analysis and Preparation of Final Report

Upon return to UK, the PI would undertake following tasks;

- Summarize the household and community survey data
- Undertake a more rigorous regression analysis, to test for the significance of individual household characteristics and income distribution
- Econometric analysis of determinants and impact of local management institutions
- Write up a final report presenting the research findings and
- Submit the final report

7. EXPECTED RESULTS/POLICY IMPLICATIONS

The research will add knowledge on how common property institutions in managing common pool resources influence the efficiency of resource use, equity of resource distribution, empowerment and welfare of community members. More importantly, it will shed light on how community-based property rights regimes function in relation to human and their use of natural resources and its implication for the sustainability of resource management. It will recommend future policy that could facilitate the effective implementation of activities to ensure the equity and optimal welfare of poor people whose livelihood is directly dependent on the long-term management of natural resource. The major output of research will be on equity, distributional implication and environmental consequences of CPR options (common property institutions) in relation to community forest management with a view to increasing the livelihood security of poor individuals, households, or communities.

The study will provide a new insight into the community-based institutions, their determinants and their impacts on resource use pattern and environmental outcome. Livelihood and community forestry linkage of the poor and their interaction with other sections of society are an important part of research to obtain a better understanding of what policy changes in the management of community forestry (existing institutional arrangements) are feasible and how poor people might use these changes to improve their livelihood security. The full understanding of the relationship between institutions, resource use pattern and forest management (degradation) outcome will be a major step toward formulating policies and programmes that aim to increase equity and enhancing the sustainability of resource base at the community level. The study will recommend future policy that will facilitate and promote efficient and equitable resource management regimes where forest-based livelihoods are pervasive features of the rural economy. It will also be possible to better inform policymakers about institutional support structures that would facilitate more equitable participatory forest management at the local level.

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