

Transaction Costs and Common Property Forest Management: Empirical Evidence from Nepal

Bhim Adhikari, Environment Department, The University of York Heslington, UK.

Email: bpa100@york.ac.uk

Abstract

Transaction costs are an important determinant in the success or failure of community-based resource management. In particular, they can affect participation in management activities, with the poor bearing a proportionally larger share of the costs. Analysis of 309 households from the Middle-Hills of Nepal reveals that transaction costs for communal forest management as a percentage of total costs are higher for poorer households (14%) than those for middle-wealth (12%) or rich households (9%). Whilst transfer of forest management responsibility to the community may lower transaction costs incurred by the state, these costs may be unequally distributed among stakeholders. This paper argues that an adequate theory of forest use should incorporate the role of institutional structures associated with different forest regimes and their associated transaction costs.

Key words: Transaction cost, common property forest management, stakeholders, decision-making, equity

INTRODUCTION

Transaction costs have been an important topic in environment and natural resource policy in recent years. The enforcement of common property rights entails costs similar in nature to those that result from the establishment of private property rights. These costs are incurred in the form of negotiation, enforcement, and monitoring of contracts, and are commonly referred to as transaction costs. In the context of Community Forest (CF) management, transaction costs are related to the opportunity cost of labor in scheme participation and are mainly time involved in meetings, time required to acquire information and communication, and direct monetary expenses incurred for travel, communication, information and so on. These costs are directly related to management effectiveness, equity and efficiency of collective action, and at the community level these costs are generally borne by poor community members. Despite the importance of these costs, transaction costs incurred in CF management are often ignored. Most institutional analyses assume that an institution exists because it minimizes costs, without examining the implications of these institutions on the level of transaction costs.

Though transaction cost economics provides a very useful tool to understanding functioning of community-based management system, there are very few empirical analyses of transaction costs, and very few comparative estimates (Leffler and Rucker 1991; Wang and van Kooten 1999; Zhang 2001). Neo-classical economic analysis has always been preoccupied with production costs, which largely ignore the transaction costs associated with production and exchange. Including transaction costs in an economic study may enable us to explore the nature of cost and benefits, and their impact on different stakeholder groups. As empirical research on transaction costs of community-based management is scarce, this study is an attempt to quantify the extent of transaction costs associated with community-based forest management in Nepal. The working hypothesis in this paper is that transaction costs incurred by households is significantly different between income groups as poor bearing large proportion of such costs.

RELEVANCE OF TRANSACTION COSTS TO COMMUNITY FOREST MANAGEMENT

Community forestry in Nepal has been implemented for almost three decades. The main objectives of CF were: (1) to fulfill the forest products needs of villagers; (2) poverty reduction in rural villages through various income-generating activities in community forests; and (3) to reduce administrative costs of government. Further, the community forestry program is often considered to be a system of forest management with a very low level of transaction costs. However, some recent studies indicate that CF is not able to contribute significantly to the livelihoods of very poor and marginalized sections of the community due to its failure to take into account issues such as the distribution of costs and benefits. Particularly important among these is the question of level of transaction costs incurred by households participating in a community forestry program.

Transaction costs in community-based forest management are incurred in a variety of ways. The relationships between forest users are based on co-ordination and exchange, which generate two different types of costs, which Williamson (1985) described as *ex ante* and *ex post* costs. While *ex ante* costs are associated with the costs of finding partners (identifying members of forest user groups) and costs incurred during negotiation (time and resources spent in defining who are the actual users of a patch of community forest); co-ordination and implementation (who is responsible for what); *ex post* costs include the cost needed to ensure that exchange is carried out as per agreement (protection monitoring costs of various forestry activities). The recurrent annual transaction costs in CF management can be broadly categorized into three major cost items: (1) transaction costs of decision-making (TC_D); (2) transaction costs to implement those decisions (TC_I); and (3) transaction costs of monitoring the implemented decisions (TC_M).

The decision costs (TC_D) include costs incurred during the process of setting-up the forest user group, acquiring information and the costs of co-ordinating activities, like resources spent for meetings, settling conflicts, and so on. These costs are incurred in devising rules that directly affect the day-to-day decisions made by appropriators concerning the method of resource extraction, exchange of information and maintaining a sustainable management of the resource. More importantly, user groups have to prepare a specific Operational Plan (OP) of their CF, which constitutes a significant part of transaction costs. Preparation of an OP is a time-consuming exercise because all user group members should understand the process, its technical content and develop consensus in many aspects of this plan. It is widely recognized that significant time and support is required at the initial stage to build a viable user group and avoid later problems of mismanagement as well as conflicts related to resource boundary and exclusion of non-owners. Time and resource invested in-group formation and organization buildings are thus key inputs in the CF process. So the TC_D is incurred in reaching decisions about user group identification, negotiation with potential members, committee formation, resource demarcation, building capacity of resource users in preparing the OP and participating in certain obligatory training activities and so on.

The transaction costs of implementation (TC_I) refer to the costs of carrying out implementation activities to comply with the management decisions made. These costs are incurred when implementing various activities like thinning, pruning, fire protection, forest road repair and maintenance and other obligatory forestry activities such as protection of forest and forest products such as control against theft and to safeguard against over-exploitation of the forests, in violation of the OPs. Moreover, commercialization, diversification of activities and increasing levels of income amongst stakeholders are also a function of forest development activities within the group.

Transaction costs of monitoring (TC_M) refer to those costs incurred for monitoring and enforcement of agreed upon rules. Monitoring and maintenance are important operational activities of the forest user group. They are carried out through (a) delegation; (b) rotation of labor; (c) general awareness;

and (d) peer monitoring. Monitoring can take the form of social auditing in the group assembly, and is widely and regularly practiced by most Community Forest User Groups (CFUGs). CFUGs are responsible for initiating/maintaining records of CFUG activities and forest management operations as well as monitoring changes in the condition of their forest. Various levels of monitoring are involved in CF such as activity monitoring, process monitoring, impact monitoring and financial monitoring. These activities consume a considerable amount of time and resources for households participating in collective action. Time is also invested in keeping records in the form of minutes and accounts in a register. The administrative system requires enforcing provision of the OP and control over forest product transport may be extensive and costly. Transaction costs in this study, therefore, were simply measured in terms of labor opportunity costs of time spent in various community activities like community meetings, time spent to acquire information, communication, and time spent in obligatory forest activities (planting, protection, weeding etc.). These costs may be substantial, and dominate other, observable (pecuniary) costs.

STUDY SITES AND DATA COLLECTION

Measuring the transaction costs of CF requires detailed knowledge of activities in which households and communities spend their time for various activities. Since there are no secondary data available for these costs, it is necessary to address this issue by primary data collection in the field. From the list of user groups provided by District Forest Offices in two middle-hill districts of Nepal, eight user groups namely Saradadevi CFUG, Jyala Chiti CFUG, Mahavedsthan CFUG and Thuli Ban CFUG in Kavre Palanchowk district and Gaurati CFUG, Shree Chhap CFUG, Janghare CFUG and Karki Tar CFUG in Sindhu Palchowk district were selected. A stratified sample of households was chosen by compiling a census of village households with Participatory Rural Appraisal (PRA) techniques. Participants of the PRA exercise were asked to categorize all households into three different stakeholder groups i.e. poor, medium and richer households based on criteria such as amount of land owned, the number of livestock owned, loans given and taken, and income from off-farm agricultural activities.

A total of 309 households were surveyed during the period of four months from September to December 2000. The data for this analysis were mainly collected from group discussion (with both forest users and members of the executive committee of CFUGs), records of the forest users committee, key-informant interviews and a household questionnaire survey. The survey team gathered information on respondents' participation and contribution to community forestry activities in terms of time, effort and money spent. The following variables were measured in order to assess the time and resources spent by households on: (1) CFUG assembly (discussing major issues like membership criteria, rules of entry, resolving the conflicts that could not be settled by the users committee, annual auditing etc); (2) CFUG committee meetings (day to day operation of CFUG activities); (3) resource maintenance activities (enrichment planting, weeding, bush cutting, thinning etc.); (4) forestry related community development activities; and (5) forest protection and monitoring activities (watching, patrolling, fire line construction, forest road repair and maintenance etc.). The minute books of executive committee of CFUG and CFUG assemblies provided the attendance figures of meetings and level of participation in these activities.

RESULTS AND DISCUSSIONS

Households' Participation in Community Forestry Activities

Households were asked to choose the most important activities related to community forests according to their level and extent of active participation. Table 1 shows the participation of households in various forest management activities according to stakeholder groups. The study have shown that about 29% of households belonging to poor stakeholder groups do not participate in any activities, though they are eligible members of the group and pay monthly fees to the user group.

Records of the CFUGs show that women and lower caste people are attending meetings, but often they leave immediately after signing the register (Poudel 1999). Due to a low level of representation of poorer stakeholders in the policy debate, they are unable to influence decision-making at all levels. It appears that there are very few households from middle and rich income groups who do not participate. The table shows that as many as 6 percent, 17 percent and 24 percent of households state that they participate in every aspect of CF respectively from poor, middle and richer income groups. So it can be concluded that it is the richer/elite of the community who controls local management institutions as well as contributes relatively more to the management aspects of community forestry.

Table 1. Percentage of households participating in various community forestry activities

CFUG Activity	Participation in CF Activities (%)		
	Poor	Middle	Rich
Does not participate	29	5	1
Forest management plan preparation	41	56	48
Implementation of decisions	20	16	21
Benefit sharing rule formulation	3	4	5
Monitoring and evaluation	1	2	1
Participation in all activities	6	17	24

Number of Days Spent in CF Activities

Table 2 gives a break down of the time spent on the various activities of community forestry as a basis for transaction cost estimation. It was interesting to note that CF related activities such as traveling, communication and monitoring are the activities that are usually undertaken by the village elites. It is clear that meetings, resource maintenance and monitoring take up the bulk of time as they are continuous activities and crucial for maintenance of the resource and institution. In most CFUGs, monitoring, information gathering, resource maintenance and attending community meetings to decide various implementation activities remain major activities. These activities include building consensus on preparation of operational rules, distribution of products, management of community funds, attending CFUG monthly assembly, and so on. Among the most evident transaction costs are effort and time spent in lengthy discussions at the meetings and assemblies as well as in protracted mediation procedures to settle conflicts. These costs obviously increase when new economic opportunities cause the value of time to rise significantly.

Table 2. Breakdown of time spent on activities in community forests (days)

User Group	Information Gathering*		Attending Meeting**		Traveling		Monitoring!		Resource Maintenance+	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Saradadevi	5.16	3.97	5.16	6.32	4.5	0.71	8.44	6.63	4.63	3.91
Jayala Chiti	6.67	7.37	3.05	3.58	10.00	7.07	12.83	9.91	3.89	4.90
Mahadevsthan	2.80	4.09	3.68	5.02	2.80	2.68	6.20	2.86	7.32	2.13
Thuli Ban	3.14	1.46	2.86	3.40	3.00	1.73	3.67	1.21	5.95	4.91
Gaurati	3.47	2.70	6.86	7.59	3.09	5.65	6.29	4.57	5.32	3.53
Shree Chhap	4.15	3.59	4.88	4.41	5.67	4.04	10.72	8.37	6.33	2.61
Janghare	13.63	18.91	4.46	5.15	7.83	5.64	13.15	16.03	5.07	7.56
Karki Tar	4.43	3.04	5.43	4.77	5.75	2.99	12.33	13.57	4.69	2.87
Average to all sites	5.62	8.31	4.31	5.03	5.06	4.80	10.36	11.07	5.56	4.67

* Including communication; ** Including conflict resolution; † Protection, watching, patrolling etc.; ‡ Planting, weeding, bush cutting, forest trial route maintenance etc.

From Table 2, it is apparent that monitoring (watching, patrolling etc.) is the major activity in which households spend time, followed by information gathering and resource maintenance. Despite their absence from key decision-making activities (in many cases), however, poorer households participate equally in general activities like monthly meetings, forest resource protection and development. Protection of a bounded area is usually done by a combination of employing a guard, with CFUG members contributing the wage, or by a labor rotation with a patrol group made up of member households. On average, each household spent about a month within a year for transaction cost related activities.

Transaction Costs by Different Forest User Groups

Table 3 shows the transaction costs of resource management in monetary terms for different categories of users based on opportunity costs of labor time spent in transaction cost related resource management activities. As we discussed earlier, opportunity costs of labor time spent in these activities might be different for different income groups. However, we could not estimate opportunity costs of time according to income groups since even richer households are quite often involved in similar livelihood activities as that of poorer ones. For example, exchanging farm labor, working as hired labor and other activities are common phenomenon for both richer and poorer as there is lack of alternative income opportunity available to each particular group in our study sites. So we have taken average farm labor wage rate prevailing in study sites to calculate the transaction costs of CF management incurred by households.

Of the eight CFUGs studied, transaction costs of forest management are lower for the poorer households in seven CFUGs. This finding again indicates that poorer households share less decision-making costs than their richer counterparts and they have less involvement in the over-all community forestry process. However, they contribute as equally as their richer counterparts in implementing obligatory forestry activities. The literature often points out that wealthier agents tend to assume the leadership role in commons' management and largely bear the costs of initiating and performing regulatory tasks of common property regimes (Baland and Platteau 1995, 1996) due to possible gains through social reputation. Moreover, they might gain considerably if a community-owned resource improves significantly after handing over government forests to community ownership as shown by Richards *et al.* (1999) in a study of participatory economic analysis of CF in Nepal.

Since transaction costs of forest management are also a function of social capital within the community as described earlier, variation in transaction cost days in different CFUGs can be explained by the social capital and forest conditions in these communities. Moreover, the extent of transaction costs of CF management depends on quality of the forest resource itself since the community has to spend a considerable amount of time on maintenance of degraded resource systems.

Table 3. Average annual transaction costs (differentiated by user group)

User Group	Average Annual Transaction Cost (NRs.)		
	Poor	Middle	Rich
Saradadevi CFUG	392	961	2,236
Jayala Chiti CFUG	436	756	1,023
Mahadevsthan CFUG	912	1,118	1,178
Thuli Ban CFUG	821	789	901
Gaurati CFUG	1,789	1,323	1,225
Shree Chhap CFUG	559	1,870	998
Janghare CFUG	1,077	731	5,475
Karki Tar CFUG	538	1,339	2,270
Average to all sites	816	1,227	1,913

Transaction Costs as a Percentage of Total Costs

How important are these transaction costs relative to the resource appropriating costs incurred by user households? In order to understand this, we further calculate the annual transaction costs as a percentage of total costs for the three different income groups. The total costs were calculated from time spent in forest products collection as evaluated by opportunity costs of labor time involved in traveling, collecting and processing of these products. Moreover, we also considered cash or payment-in-kind to the CFUG. The result is presented in Table 4. In contrast to above, transaction costs as a percentage of total costs are significantly higher for poorer households than those of middle-wealth and richer households. In higher income groups, users are putting more resources into harvesting various intermediate forestry products and they also employ hired labor for various forestry operations. So the average forest operation cost for richer households is far greater than that for poorer households.

Variation in forestry operation costs for the three different stakeholder groups can also be explained by economies of scale of these groups in respect of common property forest use. In this case, transaction costs were relatively low as a proportion of total costs, usually less than nine percent. However, in a situation in which poorer users are getting very few products (mainly firewood as opposed to other intermediate products like fodder, leaf litter and cut grass), transaction costs, as a proportion of total costs can be significant - up to 14 % of total costs.

Table 4. Transaction costs as a percent of total costs

Income Group	N	Transaction costs as percent of total costs
Poor	81	14
Middle	136	12
Rich	92	9
Average	309	11.66

Table 5 presents the analysis of variance (ANOVA) results of percent transaction costs incurred by three different income groups. The model shows that transaction costs is significantly different { $F(2,306)$, $p < 0.05$ } between the three groups included in the analysis. In other words, this table reveals that transaction costs as a percentage of total costs are higher for poor than that of relatively better off households.

Table 5. ANOVA for the percent transaction costs incurred by income groups

	Sum of Squares	Degree of Freedom	Mean Square	F	Sig.
Between Groups	1,258.42	2	629.21	3.11	.046
Within Groups	61,842.49	306	202.10		
Total	63,100.91	308			

CONCLUSIONS

Transaction costs of community-based resource management have recently received much scholarly attention (Davies & Richards 1999; Aggarwal 2000), however studies concerning the quantification of these costs are still scarce (Mburu *et al.* 2003). In this paper, I have examined the nature and extent of transaction costs incurred by user households participating in common property forest management in the middle- hills of Nepal. The aim of this paper was to explore the size, nature and significance of these costs. Although direct comparison between community-managed and centrally managed systems is difficult because of a lack of acceptable quality data, the results show that transaction costs of community-based resource management can be a significant part of resource management costs.

Community-based forest management involves implementation of different property rules, liability rules, regulations, incentives for resource management and distribution of costs and benefits among group members. Because the community plays a crucial role in collective action, it is generally assumed that transaction costs associated with community-based forest management are not of economic significance. Though this is true when comparing costs incurred by government between forests under state management and those under community management; this paper demonstrates that transaction costs could be a barrier of participation especially for poor households.

Comparing the level of household recurrent annual transaction costs with the total costs of resource appropriation reveals that transaction costs are significant share of total costs. It is particularly important for poorer households whose share of transaction costs appears to be 14 percent of total costs. Transaction costs of CF management incurred by households may be even higher if we take into account time and resources spent by communities in negotiating with the Forest Department before handing over forests to the community. In this study, we could not incorporate those costs due to lack of data. Including these prices in an economic study may enable us to explore the nature of costs and benefits, and their impact on different stakeholder groups.

Recognition of the importance of community-based institutions leads to decentralization and devolution of forest management in Nepal and other South Asian countries. Much policy prescriptions in avoiding the 'tragedy of the commons' suggest changing resource regimes i.e. to change from open access to regulated form of community property. Though the benefits of changing from an open access regime to regulated common property are widely recognized, the costs of transaction are often neglected. However, we should consider that transaction costs of community-management are not always insignificant as predicted in theory. Institutional change is not costless or instant (North 1990). Institutions are important factors for management, however, the potential costs and time for institutional transformation, i.e. the transaction costs, should be carefully considered (Zhang 2001). Empirical study of the interaction between CPR institutions and transaction costs enables policy analysts to determine how important institutions and transaction costs are for local level resource management. Moreover, proper understanding of the levels of transaction costs in community-based resource management has important welfare implications especially for enhancing livelihood security of poorer households where forest-based livelihoods are pervasive features of the rural economy. This study, therefore, has stressed the socio-economic significance of such costs and emphasized further research on comparison of transaction costs associated with different forms of property regimes.

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