Chapter 15

Changes in Intrahousehold Labor Allocation to Environmental Goods Collection: A Case Study from Rural Nepal, 1982 and 1987

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This study explores the impact of changes in environmental conditions on household labor allocation to the collection of environmental goods such as fuelwood and leaf fodder for a sample of rural Nepali hill households. Households in rural areas of most developing countries often rely heavily on the surrounding environment for goods such as water, wood, and livestock fodder. Frequently these and other environmental products are collected from local common forestland, a task that in many areas is predominantly carried out by women. Given the increasing pressure on biomass resources in many developing areas and the common gender division of collection labor, there is concern that women in particular will bear the burden of increases in resource scarcity by having to spend more labor time and effort to collect forest products.[1]

This concern appears to be a particularly valid one in the hill region of Nepal, where women may spend several hours per day collecting fuelwood, water, and cut grass or leaf fodder for livestock and growing populations are exerting more pressure on commonly owned forest resources. Studies using Nepal data from 1982/83 reveal that households respond to the increasing costliness of environmental goods, at least in the short run, by consuming

For details, see Cooke (2000).

[1]See, for example, Cecelski (1987). See also Agarwal (1986), Dankelman and Davidson (1988), and Dasgupta (1993) for discussions of women and environmental good collection.

less of them and devoting more female labor to their collection (Kumar and Hotchkiss 1988; Cooke 1998). An important line of questioning is whether this is still the case after enough time has passed for households to undertake other responses to the costliness, such as planting trees on their property. A related question is whether women's labor burdens will be lightened more than those of men and youth if local common environmental resources are improved.

In order to address these questions, this study examines changes in intrahousehold labor allocation to the collection of environmental goods over time and in response to changes in local environmental conditions for a sample of Nepali hill households. An empirical analysis of the changes in labor allocation patterns and how these relate to changing environmental conditions will contribute to a greater understanding of how policies that influence the environmental resource base may influence the welfare of different groups within households. This issue is of particular interest in Nepal, where much policy emphasis currently is being placed on local forest resource management for the improvement of local common forest resources.

Households and Forest Resources in the Hills of Nepal

The data used in the analysis are from household surveys conducted in 1982/83 and 1997 in six villages in three hill districts of Nepal. This study has the advantage of resurveying the same households after a 14-year period that allows for an assessment of the effects of environmental changes over time. Common forest resources in the survey sites have changed over this period: some for the better, some for the worse. Additionally, although two of the survey sites had some community forestry management in 1982/83, all sites with a community forest now have a formal forest user group (FUG). In 1993 Nepal passed the Forest Act, which recognized local FUGs as institutions with property rights over community forests. Management by FUGs generally involves restricting what can be taken out of the forest and exacting penalties on those who break the rules, although what the local FUGs do in practice and how effective they are varies between sites.

The households in the survey villages are mostly small-scale agriculturalists producing primarily for home consumption. Almost all of the households in the sample own their own farmland, although average landholdings dropped significantly between 1982 and 1997. Most of the sample households also own some combination of goats, cattle, and water

buffaloes. Hill households traditionally have relied extensively on local common forest areas for fuelwood, water, leaf fodder, and grass. Most energy consumption comes from fuelwood, which is primarily used for cooking. Water is collected for household consumption. Leaf fodder and cut grass are important sources of livestock feed and are seasonal in nature. Cut grass is the preferred livestock feed, but it is generally available only in the monsoon season. In the dry season households rely on leaf fodder. Collecting fuelwood, grass or leaf fodder, and water can take up many hours of a household's time in a day. The bulk of this time typically comes from adult women in the household. The rest of the household collection time comes from adult men or from older children.

Results

This analysis of the effect of forest resource scarcity on household collection and consumption of environmental goods shows that households in relatively worse environmental conditions consume less of the environmental goods and spend more time in their collection.[2] In contrast to earlier studies, this study finds that the increase in collection time comes almost equally from men and women (Table 15.1).[3] Higher collection times for both men and women are also associated with community forest management variables.

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[2]This study estimates household-level reduced-form demand equations for environmental goods and for the time allocated by different household groups (men, women, and youth) to environmental goods collection. This study has the advantage of using panel data that allow for an assessment of changes over years and seasons. Measures for forest management practices include a dummy variable for whether a ward has instituted community forest management and the number of years community forest management practices have been in place. Measures of forest resources include the area under forest cover as well as measures of forest resources available to the households in the sample. Explanatory variables also include age of the household head, dummy variables for caste and ethnicity, land- and livestock ownership, remittances, and pension payments. Finally, ward-level dummy variables and seasonal dummy variables are also included to capture the effects of any unobserved fixed ward-level factors and seasonality, respectively. The analysis also examines and corrects for possible sources of bias in the estimation, which include the possibility that certain groups within a household (especially men and youth) may not devote any time to environmental goods collection, that households may choose not to collect a given environmental product, and that households choose the place of collection.

[3]Only the table of descriptive results is presented here; the description of the rest of the results is based on Cooke (2000).

Table 15.1 Household collection time for environmental products, by season and year

	Late dry season				Monsoon season			
Variable (minutes per day)	% of sample 1997	collecting	% of sample 1982/83	collecting	% of sample 1997	collecting	% of sample 1982/83	collecting
Total collection time								
All household members	382.83	100	341.45	100	423.26	100	570.42	100
	(252.54)		(265.97)		(286.17)		(310.69)	
Men	131.01	60	45.51	73	152.98	68	160.30	46
	(115.07)		(52.20)		(144.07)		(147.26)	
Women	271.73	100	296.50	100	241.88	98	432.88	98
	(208.93)		(254.32)		(169.03)		(223.78)	
Children	115.53	37	21.70	54	153.82	55	153.24	84
	(109.53)		(31.94)		(134.50)		(115.66)	
Total collection time for								
Fuelwood	160.74	93	101.79	100	42.95	37	157.95	74
	(147.71)		(93.53)		(45.64)		(152.93)	
Water	185.01	98	139.67	100	101.28	94	129.47	99
	(169.01)		(134.93)		(99.91)		(133.47)	
Leaf fodder	65.47	54	109.43	75	96.09	24	n/a	n/a
	(91.47)		(94.43)		(73.3)			
Cut grass	132.50	13	216.80	8	315.53	95	352.47	92
	(55.61)		(110.22)		(247.73)		(257.57)	

Sources: Nepal Energy and Nutrition Survey, 1982/1983, Western Region, Nepal, Nepal Agricultural Projects Service Center, the Food and Agriculture Organization of the United Nations, and the International Food Policy Research Institute; and Nepal Household Resurveys, 1996/1997, the International Food Policy Research Institute, U.S. Agency for International Development, Goteborg University, Sweden, Winrock International–Nepal, and author's fieldwork.

Notes: These statistics were based on households in both the Nepal Energy and Nutrition Survey, 1982/1983 and the 1997 survey. Sample sizes vary owing to data availability. Means are for collecting households only. Standard deviations are in parentheses; n/a = not available.

Another finding of this study is that household collection burdens were significantly lower in 1997 than in 1982. Household women as a group have seen the largest decrease in their time spent collecting.

Encouragingly, the time it takes to collect a unit of fuelwood or leaf fodder has decreased between the two years, accounting for part of the decrease in total collection time. The picture is not an entirely rosy one, however, because consumption of environmental goods was also significantly lower in 1997 than in 1982. It appears that lower per-unit collection times are due to households' collecting more from their own property rather than to higher community resource availability. More than half of the sample households said that they had planted trees on their property over the 14-year period, many of which were specifically planted for fodder, and more than 80 percent allowed trees to grow up naturally. Further analysis shows that there is a substitution of private for common resource use as FUG rules or deforestation cause the common resource to become more scarce. Households in areas with a smaller community forest are significantly less likely to collect fodder and fuelwood from the community forest than households with a larger community forest. Similarly, households in areas with a FUG that enforces its rules are much more likely to collect fodder from their own property.

Conclusions

The results taken together show that collection labor burdens in the survey areas have decreased over time, especially for women, but that one should not hastily attribute decreases in collection time to successful forest rehabilitation in areas managed by forest user groups. In this case it appears that lower collection times are principally due to reduced consumption and increased collection from private land. This study provides empirical evidence that using one's own land to produce fuelwood and fodder is an important coping response to scarcity of community forest resources for hill households. Of course, growing trees on one's property is usually not a costless option, given the competition for space for crops, and it is obviously not an option at all for households who do not own any land. Thus the poorest households in a community are likely to bear the highest costs of environmental degradation, at least in terms of the labor burden required for collection.