

Variation in Management: Variation in Equity, Livelihoods and the Forest Conditions in South Asia¹

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ABSTRACT

A number of studies have identified several important factors responsible for management of common pool resources; and both success and failure cases have been reported across management regimes. However a little work has been done on distributional effects of the resources in varying management structures i.e. to what extent the Community Based Natural Resources Management (CBNRM) approaches and others have been able to deliver the desired goals of ensuring livelihood security and equitable distribution of benefits to the resource deficit communities. This paper focuses mainly on these equity and livelihood issues. Our basis of analysis is governed by the information available in International Forestry Resources and Institutions (IFRI) meta database by selecting community level data using variables on livelihood and equity issues relating with resource uses and resource condition. The IFRI database includes information from several countries and several locations within these countries; we have selected variables for which information are comparable. We have used the user groups (which fall under the forest association) as unit of analysis to compare different management structures vis-a-vis their effect on the equity and forest dependence. Although equity covers varying dimensions including equal rights to access the resource, the rights according to efforts made by specific segment of the society and the rights considering basic needs of the different individuals in the community; this paper uses the definition characterized by equality rules making and effects of rules on group members involved in resource use and management as proxy variables for equitable distribution of benefits. Similarly forest dependence has been measured by variables such as % share in food, fuel wood, biomass and timber requirements of the user group etc. The forest condition being the dependent variable is measured by the foresters' perception about the forest i.e. improving, decreasing or constant. The paper then investigates how the forest condition is influenced by equity and resource dependence variables under different management structures.

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1. INTRODUCTION

Natural resources management is facing new challenges in the context of changes in socio-economic, political and natural resources during last few decades. Economic structural adjustment, democratization and decentralization have been given priorities in implementing management strategies for natural resources in many Asian countries and new institutional framework for natural resources management has been debated to find better way to achieve sustainability of resources, after some unsatisfied outcomes from centralization and privatization (Ostrom, *et al.*, 1999). The approaches, such as integrated natural resources management (INRM), co-management, and community based natural resource management (CBNRM), have been promoted because of some evidences of success stories from some part of the world. Because, these approaches including CBNRM are the processes by which the people themselves are given the opportunity and/or responsibility to manage their own resources; define their needs, goals, and aspirations; and to make decisions affecting their well being (Sajise, 1995). Thus, they are basically seen as community empowerment tools for resources productivity, sustainability and equity. Ostrom, *et al.* (1999) argues that such approaches tend to give more positive outcomes on sustainability of the resources both economically and socially as well as environmentally.

Ostrom and Ostrom (1977) characterized goods into four categories on the basis of feasibility of exclusion of users and jointness of their use viz. private goods (where exclusion is feasible and goods have alternate uses), toll goods (where exclusion is feasible with joint use nature), common-pool resources (where exclusion is infeasible and there are alternate uses) and public goods (where exclusion is infeasible and joint uses exist). Besides limited models of successes, however, overall policies have not been effective due to institutional failures viz. private, government, communal management and market (Acheson, 2000). Private property rights failure occurs when private profit can not be achieved in proper resources management and the rate of profit on resources management is lower than the rate of interest. In this situation, rational private managers decide to derive short run benefit rather invest for long run and resource will be degraded. These failures of CPRs management are further substantiated in developing world because of corruption, incompetence and complex centralized bureaucracy. The reasons for these CPR failures are mainly attributed to institutional weakness, unclear boundaries, unclear rules and too big organization to be managed by local people (Ostrom, 1990).

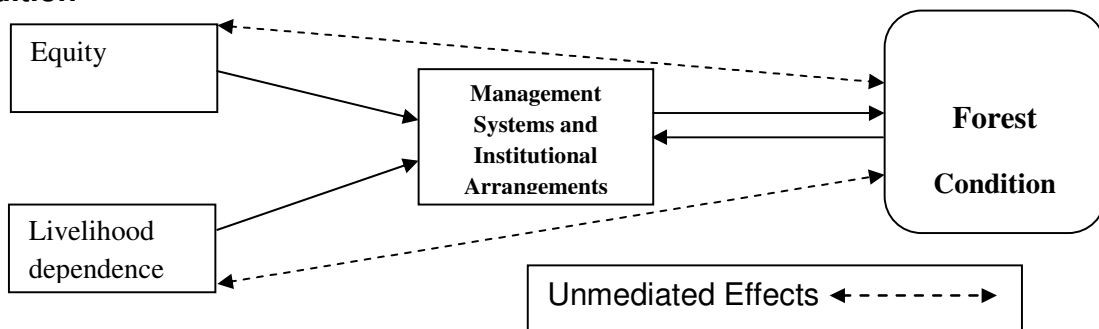
However, even with co-management models of policy implementation there is no guarantee of the efficient and equitable outcomes. The results are affected and

mediated by several contextual and institutional arrangements which are the important factors of policy success. Therefore, it is important that these issues should be considered in the alternative governance arrangements for natural resources management. Recent studies from the analysis of case studies of Asian countries from Bhutan, India, Indonesia, Nepal, Thailand and Vietnam with four major types of management structures from centrally managed to locally managed found variations in forest condition, rules in use and performance under these varying management regimes (Shivakoti and Ostrom, 2008). The issues of equitable benefit sharing among the users become more complicated for management of natural resources when implemented without due consideration for local social structures and norms. Especially for the poor families, making money from natural resources is the main source of income and major livelihood means and social safety nets (WRI, 2005). The role of CPRs in this regard is extremely important. The poor withdraw goods and services from CPRs, forest and water, with no exclusive right to anybody and hence are considered more equitable (Ostrom, 1990).

One should, however, be cautious that community based natural resources property rights don't assure equity in resource distribution although overall collection rates of forest products have been reported contributing positively in majority of income groups. Socioeconomic characteristics also play major role in appropriating benefits from forest resources and "less poor" households have better access to forest products than the "poorer" households (Adhikari *et al.*, 2004, 2007)

In this paper we attempt a preliminary exploration of the relationship among management regimes, users dependency, group equity and forest conditions. The conceptual framework is included in the Figure 1.

Fig.1 Linking Livelihood dependence, Equity, Management regimes and Forest condition



Theoretical Framework

2. METHODOLOGY

We conducted this study using the meta data base developed by International Forestry Resources and Institutions (IFRI). The data base has data from 13 IFRI CRCs located in 11 countries of Asia, Africa, Europe, Latin America and North America. Each research instruments in the IFRI manual consisting of variables which are designed with a conceptual framework intended for use by the researchers in order to link human interactions with the environments and the physical characteristics of the forests (IFRI Manual, 2004). Each of the IFRI instruments is divided into different sections, e.g., section A of every form includes history and section B includes changes of the site information since the last visit. An IFRI research instrument consists of 10 different components and a team composed of social and biological scientists undertakes extensive field study.

Mostly the IFRI methodology has been used for specific case study analysis due to difficulties in making use of meta database with its very nature of multidisciplinary, problems arose due to addition/modifications, of some variables in new studies, inconsistencies/errors in data collection and data entry and many others which the authors faced during the course of this paper. Due to the mentioned limitations, the sample size was to be reduced in case of absence of data on some site about some crucial variable (like forest conditions perceptual measures). Also due to absence of any methodological parameters to compare forest conditions across countries and even at different case study sites in a country; as mentioned by Poteete and Ostrom (2004), the estimated (foresters and user groups) measures were used for the study..

The paper is aimed at analyzing data gathered from Nepal and India due to problems of finding management diversity in some countries and problem of understanding official management structure mentioned in languages other than English (such as French, Latin etc.) In Nepal; there are three major management regimes viz. State managed, community managed and Leasehold forestry while case studies from India represent two major management structures viz. Joint Forestry Management (JFM) and state managed. In contrast to State managed management regime where state agencies carry out all management responsibilities without any involvement of local communities; JFM is aimed at involving forest dependent local stakeholders and seeks to develop partnership between local communities and state forest related agencies for sustainable use with equitable distribution of benefits ensuring sustainable environment. Two new approaches tested in Nepal in contrast to state management are Community Forestry and Leasehold forestry where the former approach is aimed at protecting well-stocked

forest and the latter approach is developed with objective to support marginal communities by direct transfer of forests to them.

In IFRI methodology, forest is defined as an area of 0.5 hectares with woody vegetation and used by a minimum of three households. It can be accessed by one distinct group and users from one settlement or different groups in a settlement can be the users. Similarly a User Group is a group of people involved in one or more activities including harvesting, use and maintenance while sharing same rights and duties to products from a forest. According to these definitions, there can be more than user groups for one forest and one user group can also be a user of more than one forests. For this study, the unit of analysis is a user group falling under the category of Forest association. This selection was done to use some variables regarding equity measurement from association. The IFRI Collaborative Research Centers (CRCs) collects data over time from same sites to measure overtime changes in forest condition, sustainable use, type and amount of forest products viz. viz. changes in harvest rules and/or association activities. But because of very nature of the study; first visit information will be collected for selected variables because all sites have not necessarily been visited more than once and it will not be comparable across case studies.

Due to methodological problem in comparison, we took estimated measures of forest condition in our study. In IFRI studies, the field research team estimates the user group's dependence on the forest for food, fuel wood, timber requirements and biomass. Similarly the team estimates forest condition based on vegetation density, species diversity, commercial value, subsistence value and ask the user group to give judgment about the forest overall condition ; keeping in view ecological variables. We have converted the five point measurement of forest condition into three viz. sparse; normal and abundant considering ecological factors. Further for the sake of simplicity, we combined 5 measures of forest condition to show its relationship with variables of management type and livelihood and equity. We already limited this study to UG falling under the category of Associations and we were to decrease the sample size further due to missing values. At the end due to low sample size, we decided to show comparison using 3-ways cross tabulation. We selected two countries Nepal and India to study how different regimes as well as equity and livelihood dependence mediated by management affect the forest condition.

Equity and livelihood dependence are the main dependent variables of the study. IFRI protocols have various variables to measure different aspects of equity and livelihood dependence. However for this study we have selected two measures for each of them. For equity we selected variables i.e. equity in rules making reflecting if most people are involved in making rules (high equity) or not; and impact of rules of association on individuals i.e. if any individuals are systematically disadvantaged due to rules (low equity) or not (high equity). As both of equity related variables are about rules; it is hypothesized that the equity in these aspects is also translated in equity in rights and responsibilities as well. Similarly, the livelihood dependence has been represented by variables viz. one is % households significantly dependent upon the forest(s) for

livelihood and the other is % of households Fodder, fuel wood, timber, biomass and food requirements met from the forest(s). The descriptive statistics of the variables used is given in Annexure-II.

The sample comprised of 3 different types of management regimes in Nepal viz. State managed, community managed and leasehold with a sample size of 18 user groups and 2 in India viz. State and Joint Forestry Management (JFM) with a sample size of 30 as shown in Fig 1.

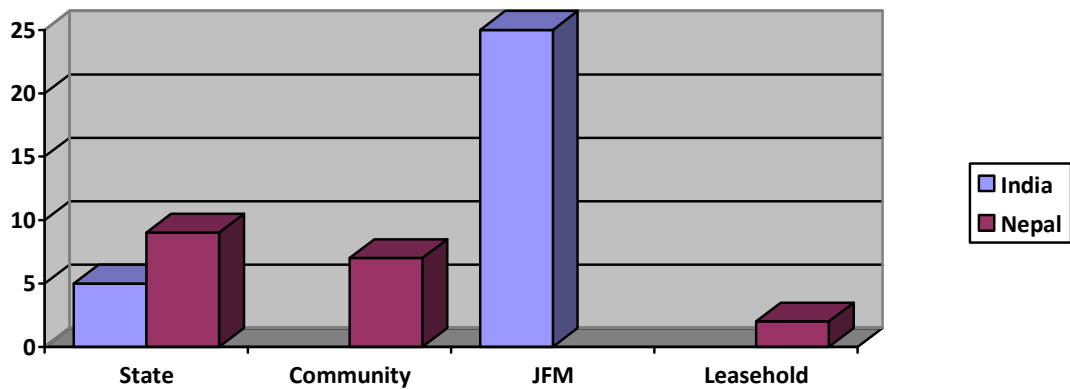


Figure 2: Sampled UG with different Management regimes

3. RESULTS

3.1 Forest Condition

As mentioned earlier we used perceptual measures based on the estimates of foresters and user groups about the forest condition and draw correlation among different measures (Table 1). Most of the measures showed positive correlation except for correlation between commercial value and subsistence value in India and subsistence value and UG perception about forest condition in Nepal.

Table 1: Spearman's rho Correlation among different measures of Forest Condition in India and Nepal

INDIA	Vegetation Density	Species Diversity	Commercial Value	Subsistence Value	User Groups perception
Vegetation Density		.440(*)	.324	.231	.484(**)
Species Diversity			.282	.450(*)	.232

Commercial Value								-0.107		.173
Subsistence Value										.364(*)
User Groups perception										
Nepal	Vegetation Density	Species Diversity	Commercial Value	Subsistence Value	User Groups perception					
Vegetation Density		.588(*)	.670(**)	.319	.404					
Species Diversity			.480(*)	.342	.686(**)					
Commercial Value				.040	.699(**)					
Subsistence Value										-.121
User Groups perception										

* Correlation is significant at the 0.05 level (2-tailed). ** Correlation is significant at the 0.01 level (2-tailed).

3.2 Forest Condition in different management regimes

The results show varying relationship among different measures of forest condition and management structure (Table 2). The overall condition of forests under state and community control is normal and in case leasehold forests it is sparse in Nepal. The sparse condition of leasehold forests in Nepal lies in the fact that marginal forests have been transferred to very poor households to fulfill their needs. In India; both state and Joint Forestry Management Forests (JFM) have normal condition (details about calculation on Appendix-1)

Table 2: Forest condition in different Management regimes

Country	Management Type	Perception based condition					Overall Condition
		UG perception	Foresters perception				
			Commercial Value	Subsistence value	Species diversity	Vegetation density	
Nepal	State	Abundant	Normal	Normal	Normal	Abundant	Normal
	Community	Abundant	Normal	Normal	Normal	Sparse	Normal
	Lease hold	Sparse	Below Normal	Below Normal	Sparse	Sparse	Sparse
India	State	Sparse	Normal/Above Normal	Above Normal	Normal/Sparse	Normal	Normal
	JFM	Normal	Normal	Normal	Sparse	Abundant	Normal

3.3 Livelihood based on % of Households significantly depending on the forest resources for subsistence under different management regimes and forest condition

The dependency of households is divided into two categories i.e. Low and High; by devising criteria as if less than 50% households significantly depend on forest for livelihood as Low Dependence and otherwise High Dependence.

The results showed that in State managed forests in India; UG with high dependency have higher cumulative score of forest condition is “below normal” while in case of low dependence have “normal” condition (Table below). Also a less number of UG have high dependency on the state forests. On the contrary; more UG have high dependency on the JFM forests and in this case higher cumulative score is in the category of “normal” condition. The table shows that in case of low dependency; the forests have poorer condition as compared to other forests in the area.

Table 3: Livelihood based on % of Households significantly depends on the forest under different management regimes and forest condition in India

Management	Forest Condition	Livelihood on basis of % of HHs in UG dependent on the forest(s) (<50% low and >50% high)		Total
		Low dependency	High dependency	
State	Sparse	3	5	8
	Normal	8	2	10
	Abundant	4	3	7
	Total	15	10	25
JFM	Sparse	13	35	48
	Normal	8	40	48
	Abundant	4	25	29
	Total	25	100	125

Similarly in case of Nepal; majority of the households have high dependence on the forests both in case of state and community management. While, there is less dependence in the results in case of leasehold forestry. However in low dependency, the forests condition is sparse both in state and community managed forests as compared to high dependency where the forest condition is normal. The leasehold forestry has less dependence and poor condition.

Table 4: Livelihood based on % of Households significantly depends on the forest under different management regimes and forest condition in Nepal

Management	Forest Condition	Livelihood on basis of % of HHs in UG dependent on the forest(s) (<50% low and >50% high)		Total
		Low dependency	High dependency	
State	Sparse	4	6	10
	Normal	1	20	21
	Abundant	0	13	13
	Total	5	39	44
Community	Sparse	5	4	9
	Normal	3	14	17
	Abundant	1	7	8
	Total	9	25	34
Leasehold	Sparse	10	0	10
	Normal	0	0	0
	Abundant	0	0	0
	Total	10	0	10

3.4 Livelihood based on % of Households needs (fodder, fuel wood, biomass, timber and food) met from the forest(s).

The livelihood of the UG is also measured in terms of % of households needs for fodder, fuel wood, biomass, timber and food from the forest. The results show (Table 5) varying degree of extraction of household requirements of these products from the forests. In case of India there is a higher dependence for fodder, fuelwood and timber from state forests and the forests have "Normal" condition and there is less dependence on state forests for biomass and food as compared to UG requirements. In case of food requirements as compared to total food requirements; lesser needs meet from these forests is logical but still with lesser proportion of demand; the gains in monetary terms can be significant. The UG; on the other hand have lower dependence on JFM for their requirements and their condition is also "Normal". In case of Nepal; the state forests fulfill high fuelwood requirements of UG, while community forests seem to provide fodder and fuel wood requirements. The conditions of forests under sampled UG uses seem to be "Normal" in both state and community forests. The condition of leasehold forests is "Sparse" despite lower livelihood dependence. The reason behind this can be poor condition of leasehold forests at the time they were handed over to the communities.

Table 5: Forest condition under different management structures with Livelihood dependence (Low i.e. <50% and High i.e. >50% requirements of UG for given items met from the forests)

Country	Management	Forest Condition	Livelihood dependence based on % of requirements met from the forest (High i.e. >50% and Low i.e. <50%)										
			Fodder		Fuelwood		Timber		Biomass		Food		
			Low	High	Low	High	Low	High	Low	High	Low	High	
India	State	Sparse	3	5	0	8	3	5	6	2	8	0	
		Normal	1	9	0	10	1	9	4	6	10	0	
		Abundant	1	6	0	7	1	6	5	2	7	0	
	JFM	Sparse	33	15	35	13	42	6	40	8	48	0	
		Normal	35	12	22	26	41	7	20	28	48	0	
		Abundant	22	7	23	6	17	12	15	14	29	0	
	Nepal	State	Sparse	2	2	0	4	2	2	4	0	4	0
			Normal	12	6	6	12	14	4	18	0	18	0
			Abundant	6	7	4	9	9	4	13	0	13	0
Community		Sparse	4	1	2	3	8	1	8	1	9	0	
		Normal	7	9	5	11	8	9	11	6	17	0	
		Abundant	4	5	3	6	4	5	6	3	9	0	
Leasehold		Sparse	10	0	10	0	10	0	10	0	10	0	
		Normal	-	-	-	-	-	-	-	-	-	-	
		Abundant	-	-	-	-	-	-	-	-	-	-	

3.5 Variation in Equity based on right to make rules under different management regimes and variation in forest condition

The right for rules making to majority of the members of UG is taken as proxy for equity among the user group members and has been divided into high equity i.e. majority is responsible for rules making and low equity i.e. only small proportion of members make rules. The results showed that in state managed forests there was higher participation in rule making than in JFM. While the in state managed forests, the low equity in rules making resulted in majority of similar condition forests while in low equity majority forests are with poorer condition. In case of JFM; the lower equity in rules making has resulted in majority poorer and same condition forests (Table 6).

Table 6: Forest Condition (Combined for 5 perception based measures) with different Equity in rules making and different management regimes in India

Management	Forest Condition	Equity in Rules Making		Total
		High	Low	
State	Sparse	2	6	8
	Normal	6	4	10
	Abundant	2	5	7
	Total	10	15	25
JFM	Sparse	0	48	48
	Normal	0	48	48
	Abundant	0	29	29
	Total	0	125	125

In case of equity measured by negative effect of rules making on some individuals, the UG of state forests seem to have more equity as individuals are not disadvantaged due to rules making and majority of the forests have “Normal” condition. While in case of JFM; a number of UG (though not majority) have some individuals worse off due to new rules. Here the forests condition is “Sparse-Normal” with equal cumulative scores.

Table 7: Forest Condition (Combined for 5 perception based measures) with different Equity (based on disadvantageous position due to rules) and different management regimes in India

Management	Forest Condition	Equity (measured by disadvantageous position of members due to rules making)		Total
		High	Low	
State	Sparse	8	0	8
	Normal	10	0	10
	Abundant	7	0	7
	Total	25	0	25
JFM	Sparse	27	21	48
	Normal	31	17	48
	Abundant	12	12	24
	Total	70	50	120

In case of Nepal; majority of sampled UG have less equity in rules making and the forests condition is “Normal” whereas high inequity is found in community forestry, with “Normal” forests (Table 8)

Table 8: Forest Condition (Combined for 5 perception based measures) with different Equity in rules making and different management regimes in Nepal

Management	Forest Condition	Equity in Rules Making		Total
		High	Low	
State	Sparse	8	2	10
	Normal	9	12	21
	Abundant	2	9	11
	Total	19	23	42
Community	Sparse	1	8	9
	Normal	3	14	17
	Abundant	1	8	9
	Total	5	30	35
Leasehold	Sparse	0	10	10
	Normal	0	0	0
	Abundant	0	0	0
	Sparse	0	10	10

In case of equity measured by negative effect of rules making on some individuals, both the state forests UG and community forests UG have less equity and only few people are responsible for rules making and majority of the forests are with “Normal” condition. In case of Leasehold forestry, the UG has less equity in rules making and the forests condition is also “sparse” (Table 9).

Table 9: Forest Condition (Combined for 5 perception based measures) with different Equity (based on disadvantageous position due to rules) and different management regimes in Nepal

Management	Forest Condition	Equity (measured by disadvantageous position of members due to rules making)		Total
		High	Low	
State	Sparse	8	2	10
	Normal	11	10	21
	Abundant	5	8	13
	Total	24	20	44

Community	Sparse	9	0	9
	Normal	14	0	14
	Abundant	7	0	7
	Total	30	0	30
Leasehold	Sparse	0	10	10
	Normal	0	0	0
	Abundant	0	0	0
	Total	0	10	10

4. CONCLUSION AND THE WAY FORWARD

The study is set out to examine the reciprocal relationships between forest condition under different management systems or institutional arrangements and equity and livelihood dependence. The various measures of forest condition using IFRI protocols showed a variation from “Abundant” to “Sparse” under varying management regimes. Different levels of livelihood dependence of the user groups for the forest resources mediated by management regimes have shown high dependency resulting in better forest condition than low dependency both in state and community managed forests. The state managed forests’ user groups have more equity in rules making and less equity due to disadvantageous position in case of new rules than the community management forests related user groups. We used simple cross tabulations to see relationships between forests condition and livelihood dependence and rules related equity aspects and inclusion of more variables measuring different aspect of dependency and equity and multivariate methods will improve analysis.

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Management and Forest Condition

India	State (n=5)	JFM (n=25)
Sparse	8	48
Normal	10	48
Abundant	7	29

NEPAL	State (n=9)	Community (n=7)	Leasehold (n= 2)
Sparse	10	9	10
Normal	21	17	0
Abundant	13	9	0

Note: Figures in the tables reflect aggregate score of 5 different forest condition measures.

Descriptive Statistics of variables used in analysis for Nepal

Variables	Description	Min. Value	Max. Value	Mean	Std. Deviation
<i>Dependent Variables</i>					
Forest Condition based on Vegetation Density	Forester ranking of vegetation density of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	1.89	.900
Forest Condition based on Species Diversity	Forester ranking of species diversity of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	1.83	.618
Forest Condition based on Commercial Value	Forester ranking of commercial value of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	1.78	.732
Forest Condition based on Subsistence Value	Forester ranking of subsistence value of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	2.00	.594
Forest Condition based on User Group Perception	User Groups perception about condition of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	2.12	.928
<i>Independent Variables</i>					
Participation in Rules Making	Participation in rules making process used as indicator of equity (1=High participation; 2= Low participation)	1	2	1.72	.461
Worse off position due to	Disparity leading to make some individuals worse off due	1	2	1.24	.437

new rules	to new rules used as an indicator for equity (1=nobody disadvantaged; 2= some households disadvantaged)				
User Groups FODDER needs	% of User Groups Fodder needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	2	1.40	.507
User Groups FUELWOOD needs	% of User Groups Fuelwood needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	2	1.60	.507
User Groups TIMBER needs	% of User Groups Timber needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	2	1.31	.479
User Groups BIOMASS needs	% of User Groups Biomass needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	2	1.13	.342
User Groups FOOD needs	% of User Groups Food needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	1*	1.00	.000
Households significantly dependent	% of UG households significantly dependent upon the forest (converted to scale of 1-2 with 1=less than 50% and 2=more than 50%)	1	2	1.72	.461

Management Regimes Describes official status and management of the forest (where 1=State managed, 2=Community managed and 3=Leasehold)

*no household was meeting more than 50% food requirements from forest

Descriptive Statistics of variables used in analysis for India

Variables	Description	Min. Value	Max. Value	Mean	Std. Deviation
<i>Dependent Variables</i>					
Forest Condition based on Vegetation Density	Forester ranking of vegetation density of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	1.97	.809
Forest Condition based on Species Diversity	Forester ranking of species diversity of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	1.57	.679
Forest Condition based on Commercial Value	Forester ranking of commercial value of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	1.90	.759
Forest Condition based on Subsistence Value	Forester ranking of subsistence value of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	2.07	.785
Forest Condition based on User Group Perception	User Groups perception about condition of forest, converted into a scale of 1-3 (where 1=poorer; 2=same; 3=better)	1	3	1.83	.791

Independent Variables

Participation in Rules Making	Participation in rules making process used as indicator of equity (1=High participation; 2= Low participation)	1	2	1.93	.254
Worse off position due to new rules	Disparity leading to make some individuals worse off due to new rules used as an indicator for equity (1=nobody disadvantaged; 2= some households disadvantaged)	1	2	1.33	.479
User Groups FODDER needs	% of User Groups Fodder needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	2	1.37	.490
User Groups FUELWOOD needs	% of User Groups Fuelwood needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	2	1.47	.507
User Groups TIMBER needs	% of User Groups Timber needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	2	1.30	.466
User Groups BIOMASS needs	% of User Groups Biomass needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	2	1.40	.498
User Groups FOOD needs	% of User Groups Food needs met from the forest (converted to scale of 1-2 with 1=less than 50% and 2= more than 50%)	1	1*	1.00	.000

Households significantly dependent	% of UG households significantly dependent upon the forest (converted to scale of 1-2 with 1=less than 50% households and 2=more than 50% households)	1	2	1.73	.450
<i>Management Regimes</i>	Describes official status and management of the forest (where 1=State managed, 2= Joint Forestry Management)				

*no household was meeting more than 50% food requirements from forest