

Determinants of People's Participation in Forest Protection and Management: A Study in Kaski, Nepal

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Abstract

Forests are easily available renewable natural resources in the world that directly and indirectly provide socio-economic benefits to the people living in and around the forests and also environmental protection and ecological balance to the global people. In Nepal, traditionally people's participation in forest protection and sustainable management was very popular through many informal traditional and indigenous forest management committees. But, unfortunately, there was a huge loss of forests in quantity, quality and density due to some unfavourable socio-economic and political situations. So, the government has formally, legally and gradually shifted from centralized to decentralized protection and management of forests since mid of 1970's through various forest plans, policies, acts, regulation and guidelines. The major aims of people's participation are to get basic forest products, socio-economic development, and overall improvement of forest resources. Moreover, the role of I/NGOs and other stakeholders should be as partner, advisor, facilitator and more technical supporter for effective participation of people. However, the major challenges of people's participation is how to make meaningful involvement of local people in better forest protection, management and sustainable development so that they will get sustainable economic benefits for livelihood, environmental protection and ecological balance.

Key words: *People's participation, participatory forest management, forest protection, sustainable forest management, forest products.*

BACKGROUND

Forests are easily available renewable natural resource. But it has been under-valued and not been managed on a sustainable basis in the past. As a result, these valuable forests are deteriorating in quantity, quality and density. However, in the last three and half decades, the scenario has begun to change. The centralized management of forest has gradually devolved into decentralized to the local community participation in the name of 'Participatory Forest Management (PFM)'. It has become more popular in late 1980s and got wider scope in 1990s. PFM is often defined as the practice of forestry programme where trees are planted on common land to meet the specific needs of the community like fuel wood, fodder, grass, timber, pole and non-timber

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forest products (NTFPs). PFM means the 'Forestry of the people, for the people and by the people' (Karki, 2003). But, the model of forest management varies from country to country that is based on their political, socio-economic, and cultural practices etc. People's participation in forest protection and management work is generally known as the forestry programmes which are initiated by the government with the participation of local people living in and around the forests (Gilmour et. al., 1987). FAO defined 'People's Participation' as a process by which the rural poor are able to organize themselves and through their own organization are able to identify their own needs, share in the design, implementation and evaluation of the participatory action. It has also been described as 'Village Centered with Technical Inputs of government' programmes (Gilmour et. al., 1987).

People's participation in forest protection and its management has been very common in most of the developing countries like Nepal, India, Bhutan, Pakistan etc. It has been recognized as a key element and essential part in natural resource management like forests since mid of 1970's. So, it is the absolute involvement of local communities in any specific forestry programmes beginning from appraisal to planning, implementation, monitoring, evaluation, sustainable operation and maintenance etc. There are many forms of people's participation like community forest management, leasehold forest, collaborative forest management, joint forest management, social forestry, etc.

People's participation largely depends upon the socio-economic condition of the local people living in and around the forests. The major aims of people's participation in forest protection and management are to continuous getting basic forest products, socio-economic development of the forest users and for better condition of forests. However, the willingness to participate in forest protection and management activities generally depends upon motivation arising from growing shortage of forest products and suitable forest policy and legislation of government (Arnold & Campbell, 1985). If people are assured that they are getting sustainable benefits from the forests both in short and long term, people will easily involved in forest protection and management activities. But if the government fails to give assure to people about it, they will start developing mistrust and the result will be less participation and that will be less fruitful.

People are to be involved in such a way that they are clear about their needs, responsibility and the government rules, regulations, policy and programmes. The responsibility should be permanent in nature and legalized as the local people will continue to manage the forests for their needs of forest products. Accessibility of forest resources is another factor in determining the interest of local people in forestry activities. People who have shortage of forest products will show considerable interest

in forestry activities but those who have plenty of resources will show only least interest or may be no interest at all in forestry programmes.

Full participation of people basically consists of the four interrelated process like planning (creating the ideas), decision making (deciding whether or not to do it), implementation (doing the work) and evaluation (making a value judgment afterwards about the worth of the action) but out of them decision making is considered as most important among them. People know better about their needs and resource availability in their forests than others. However, there are some crucial conditions for meaningful participation of local people in forests protection and management work like sense of ownership, awareness of collective issues, sufficient incentive of the people to give time and labour for forest protection in lieu of the intermediate and final products both in short and long term. So, to success the forestry programme, all components are equally important but the negotiation is the key point in management of the common forests that covers many aspects like interests of the forest users, social-economic structure of the villages, biological aspects of the forests, and skill of forestry staff etc. Local people must be involved and it is not only in the form of physical standing but also in managerial level of decision making (Joshi, 1989).

Therefore, people participation is taken as the key to success of forest protection, management, sustained their livelihoods and local community development. Besides, some other agencies like forestry department staff, internal and external forestry experts can also be involved together in the common forest protection and management. Government could play a significant role as a facilitator providing technical support.

OBJECTIVES

The general objective of the study is to identify the nature, level and major factors that determine people's participation in forest protection and management programmes in the study area. However, the specific objective of the study is to analyze the role of different determinants for people's participation in forest protection and management whether they are significant or not.

LITERATURE REVIEW

There was a dramatic transformation in global forest protection, management and their uses through the people's participation since the late 20th century and the global forestry priority shifted from forest production to environmental and ecological balance in the 1980's (Houghton, 1990). South Asian countries still have been pursuing indigenous forests management system based on their bio-physical and socio-economic condition (ICIMOD, 1995). The main reason for shifting top-down to bottom-up approach is the failure of past approaches by state agencies (Thompson, 1995). The government of Nepal passed legislation in 1978 to handover the substantial amount of national

forests to local communities for protection and management through the *Panchayats* (a lowest level of local government). Then, the focus was shifted from *Panchayats* to the community forest user groups (CFUGs) with more authority and responsibility with the Forest Act-1993 and Forest Regulation-1995. Under these act and regulation, CFUGs can develop their own 'Operational Plan', set the prices of forest products and determine how to use the surplus income. Thought trees and NTFPs are legally belonging to user groups, ownership of the land remaining with the State. The state also reserved the rights to take back of the community forest if the terms and conditions of handover are not met.

The Government of Nepal issued the 'Community Forestry Development Guidelines-2001', which laid particular emphasis of women participation. Consequently, the participation of women in CFM is increasing considerable. The government alone cannot successfully do the forest protection and management programmes without involving local people (Mehta, 2001). Nepal has made a significant progress in development of forest resources through the people's participation in forest protection and management activities in the name of Community Forestry Programme (Joshi, 2004). In Nepal, it is successfully increasing the greenery of degraded sites, biodiversity and environmental situation forming, local level institutions for revenue management and improving the supply of forest products to farmers in the Hills of Nepal (Acharya, 2003). There is a vital importance of bottom-up planning in the community forestry that involves and consults each and every stakeholder (Joshi, 2004). The forest use, protection and management would be integrated which is possible only through the active cooperation and participation of the local people (Nadkarni, 1989). Forest products have not been equally distribution due to less involvement of poor, women, and landless and disadvantaged group in decision-making (Shrestha & Sharma, 2004). The participation of women and DAGs in forest protection, management and decision-making is still low but gradually increasing over time period.

RESEARCH METHODOLOGY

This section presents brief introduction of the study area, data collection procedures, specification of the variables and regression model.

Study Area

Kaski district is one of the 75 districts that lies in the Western Development Region of Nepal. It covers an area of 2,018 km² which is 1.37 % of the nation. It spreads between 28^o.6' to 28^o.36' north latitude and 80^o.40' to 84^o.12' east longitude. The elevation of the district varies from 450 m. to 7939 m. The district is surrounded by Lamjung and Tanahun in the east, Parbat in the west, Manang and Lamjung in the north and Tanahun and Syangja in the south (CBS, 2014). It has sub-tropical and temperate climate. The center of the district is Pokhara that is located at 200 km. west from Kathmandu, capital city of the nation.

Total population of the district is 4, 92,098 out of which 236385 (48.04%) males and 255713 (51.96 %) females with 1, 25,673 households (CBS, 2012). The average size of household is 3.92 with the population density is 244 per sq. km. There are 475 FUGs using 17,456 hectares forest in the district that by 2014 (record of district forest office, Kaski) out of which 5 FUGs from the district have been randomly selected as sample FUGs for the study namely Phurketari (located at ward 6 of Hemja VDC), Situm Kasheri and Simsar (located at Gaire Gaun ward 8 and 9 of Bharat Pokhari VDC), Pragatishil (located at sishuwa ward 6 of Lakhnath Municipality), Sundar Ban Batika (located at ward no 16 of Pokhara Sub-Metropolitan), and Bamdibhir (located in wards 3, 5 and 6 of Chapakot VDC). A brief introduction of those sample FUGs including socio-economic, bio-physical and institutional features are shown in Table 1.

Table 1: Major Features of Sample FUGs of Kaski

S. N.	Name of FUG Particulars	Phurketari FUG	Situm Kasyari and Simsar FUG	Pragatishil FUG	Sundarban Batika FUG	Bamdibhir FUG
1	Registration Date	1991	1991	1992	1992	1993
2	Forest area	16 ha.	162 ha.	58 ha.	19 ha	49 ha.
3	Total HH members	48	181	341	114	139
4	Total HH based on caste	H.C. = 37 L. C. = 11	H.C. = 150 L.C. = 31	H.C.= 281 L.C. = 60	H.C.= 112 L.C. = 2	H.C.=107 L.C. = 32
5	Major tree and fodder species availability	Utish, Paiun, Katus, Mauwa, Katmiro, Paiun	Sal, Katus, Chilauni, Katus, Khanu	Chilauni, Sal, Sioss, Khair, Ground Grass	Utish, Paiun, Ipilipi, Paiun	Chilauni, Katus, Mauwa, Katus, Nallto
6	Major animal and bird species availability	Deer, Leopard, Pheasant, Dove, Nightingale	Tiger, Deer, Leopard, Nightingale	Monkey, Fox, Pheasant, Dove, Nightingale	Fox, Deer, Long-tailed bird, Dove	Tiger, Fox, Leopard, Deer, Dove, Parrot,
7	Major NTFP medicinal plant availability	Amiro, Aisenlu, Titepati	Bamboo, Nigalo, Amiro Jayan, chaphun	Kamaro, Gurjo, Bet, Amala, Kamaro	No major Specific	Bamboo, Nigalo, Amliso
8	Exe.Com.members	11	11	13	11	11
9	Chairperson through	Selection	Selection	Selection	Election	Selection
10	Female member in E. C.	4	3	13	5	4
11	Given period of E.C.	2 Years	2 Years	2 Years	2 Years	2 Years
12	Meeting of E. Comt.	Once a month	Once a Month	Once a month	Once a Month	Once a month
13	Meeting of Gen. Body	once a Year	Once a Year	Once a Year	Once a Year	Once a Year

Source: FUG Offices, 2014

Research Design

The study is designed in accordance with the given objectives of the study that followed both of descriptive and analytical methods. The descriptive method is used to explore the nature of people's participation in forestry programme where as analytical method is used to analyse the major determinants of people's participation by using a regression analysis. The study is fully based on the primary data and information and also supplemented by secondary data and information to arrive at valid analysis, inferences and conclusion. The secondary data and information are collected from the various publications using desk approach. The primary data and information are collected from the household survey through a well structured and pre-tested questionnaire, informal discussion, and formal focus group discussion as key informants and participatory observation of the study area. A regression analysis is used to find out the magnitude of major determinants of people's participation. Besides, t-test, F-test, and D-W test are also made for hypothesis testing.

Sample and Sampling Procedure

Two sampling procedures were followed in which the first stage is selecting 5 FUGs out of total FUGs of the study area by assuming the similar characteristics in all respect with other FUGs. The sample size of the study is 100 that were randomly selected 20 household members from each selected FUGs applying without replacement lottery method assuming that the selected households would properly represent for the socio-economic diversities of the non-sampled household members.

Tools of Data Collection

The study used four tools of collecting primary data and information. The first tool is the 'Household Survey' from the randomly selected 100 sampled households through a well structured and pre-tested questionnaire. The second tool is the 'Informal Discussion' with the non-sample household members of user groups concerning the existing problems for their participation in forestry programmes. The third tool is the 'Formal Focus Group Discussion' with the former FUG committee members, district and range-post level forest officials, political leaders, village level representatives, teachers, social workers, senior citizens, NGOs representatives and other knowledgeable persons of the study area as key informants in order to develop a better understanding of existing situation of people's participation in forestry programmes through a set of guidelines. The fourth tool is the 'Participatory Observation' in order to verify the collected information with the ground reality on the issues of their participation. All given tools collection primary data were used by the researcher himself visiting door to door with the help of local representatives.

Specification of the Variables and Model

The study used a multiple log-linear regression equation of people's participation in forestry programme as a dependent variable. However, the nature and level of people's participation depends upon several independent socio-economic factors like size of land holding (SLH), number of livestock keeping (NLSK), number of household members (NHM), distance between residence and government forest (DRGF), distance between residence and community forest (DRCF), distance between residence and main market (DRMM), gross household income received from community forests (GHY) in the form of timber, small timber, pole, firewood, fodder, grass, leaf litter, medicinal plants, herbs, fruits and nuts etc. and forest degradation index (FDI). Therefore we specify a log-linear multiple regression model in which the log of dependent variable is a linear function of logs of regressors (Gujarati, 2006) as follow:

$$\ln PPI_j = \alpha + \beta_1 \ln SLH_j + \beta_2 \ln NLK_j + \beta_3 \ln NHM_j + \beta_4 \ln DRGF_j + \beta_5 \ln DRCF_j + \beta_6 \ln DRMM_j + \beta_7 \ln GHY_j + \beta_8 \ln FDI_j + \varepsilon \quad (1)$$

Where,

PPI = People's participation index, the dependent variable, \ln = logarithm, ε = Error term, α = Constant/Intercept term, β_i = Coefficients on independent variables (where, $i = 1, 2, \dots, 8$), j = The j th household selected from each of the 5 FUGs.

The regressors in the right hand side of equation (1) are as introduced in the text-paragraph.

The list of the explanatory variables, assumed coefficients and their expected sign are summarized in Table 2.

Table 2: Coefficients and Their Expected Signs

Variables	Coefficients	Coefficients' Expected Sign
Constant	α	?
SLH	β_1	+
NLK	β_2	+
NHM	β_3	+
DRGF	β_4	+
DRCF	β_5	-
DRMM	β_6	+
GHY	β_7	+
FDI	β_8	+

Hypotheses Setting

There is a significant relationship of the people's participation (PPI) in forest protection and management with the selected independent variables especially with the size of land holding (SLD), number of livestock keeping (NLK), number of household members (NHM), and household income receive from community forest (GHY). So, these hypotheses were tested by using t-test for the regression coefficients and F-test for the linearity of the fitted equation (model) at 0.01, 0.05 and 0.10 levels of significance as per the respective degrees of freedom.

Data Processing and Techniques of Analysis

After conducting household survey, the collected data and information were organized and processed through the statistical computer package of 'Microsoft Excel' and 'SPSS' for data analysis. Different types of statistical and econometric tools were used for data analysis and interpretation like coefficient of correlation, multiple regression, coefficient of determinants, adjusted coefficient of determinants, standard error of the parameters, t-test, F-test, auto-correlation etc.

DATA ANALYSIS AND INTERPRETATION

Basically, people living in and around the forest participate in forest protection and management work with three different reasons like fulfilling the basic forest products like timber, pole, fuel wood, fodder, grass, leaf litter, fruits, herbs and other NTFPs; helping to maintain environmental stability cum ecological balance and generate income and employment opportunities for rural community. But, the basic causes of people's participation in the study area are getting more forest products, socio-economic benefits, regeneration of forests, requirement of compulsory membership in FUGs, and restriction for non-members to use the forests and forest products. The nature and level of people's participation in the study area is somehow different as some households get only membership but not attend any meeting, some attend only meeting but do not provide own views to the meeting, but some households put questions, give own views and also can influence their voice in the meeting etc.

As women are traditionally real collectors and users of the forest products like fuel wood, fodder, grass, herbs and NTFPs, they could play a significant and constructive role in forest protection, management, optimal use and sustainable development of forest. So, it is also believed that women have better knowledge of availability and use of different forest products for different purposes in different seasons. Hence, women should be encouraged to participate in the user groups. The community forestry guidelines of Nepal have mentioned at least 33% of women members should be in the FUGs. However, women participation in the study area is also gradually increasing.

Besides, the rural poor and disadvantage group (DAGs) of the society are also the prime users of forests and forest products for their subsistence and livelihood so that they have also to be involved in forestry programme as well for their better subsistence and livelihood. However, there are very less and insignificant involvement in the forestry programmes of the study area due to some socio-economic and cultural suppression in the society.

It is obvious that the level of people's participation in various forest protection and management activities is significantly determined by various socio-economic, physical and environmental factors. So, people's participation is taken as the response (dependent) variable whereas some social, economic, physical and environmental factors are taken as explanatory (independent) variables like size of land holding (SLH), number of livestock keeping (NLK), total household members (THM), distance between residence and government forests (DRGF), distance between residence and community forests (DRCF), distance between residence and main market (DRMM), gross household income from community forests (GHY) and overall forest condition (FDI) etc. Besides, there might be some other variables that may significantly affect to the process of people's participation but that are not taken in the model due to some constraints of the study. Basically, the model is drawn in order to observe the degree of change in people's participation with any change in the given explanatory variables. The estimated results associated to the log-linear model (1) of this study are given in Table 3.

Table 3: Results of Statistical Analysis for Determinants of PPI

Variables	Coefficient Size	Standard Error	t-value
Constant	2.358	0.757	3.125
lnSLH	0.046	0.068	1.671 ***
lnNLK	0.207	0.088	2.358 **
lnNHM	0.266	0.216	-1.231
lnDRGF	0.031	0.211	0.149
lnDRCF	-0.087	0.065	1.739 **
lnDRMM	0.070	0.070	-1.000
lnGHY	1.257	0.567	-2.217 **
lnFDI	0.073	0.075	1.975 **
Summary Statistics	r = 0.614, R ² = 0.499, Adj.R ² = 0.394 F-value = 2.591 **, D-W value= 1.503 **, N = 100		

Note: * Significant at 1% level, ** Significant at 5% level, *** Significant at 10% level

Source: Author's estimation

The information contained in Table 3 shows that the selected predictors in the model are found with the expected sign of coefficient which show that a unit increase in any predictor with positive sign of the coefficient leads to increase in the response (dependent) variable by the respective percentage where as with negative sign of the coefficient shows that a unit (i.e., km.) increase in such variable leads to reduce in response variable by the respective percentage which are the favourable results.

Similarly, the calculated t-value of SLH, NLK, THM, DRCF, GHY and FDI is greater than its tabulated value ($t_{cal} > t_{tab}$), these are statistically significant at either 1% or 5% or 10% level of significance by rejecting null hypothesis all those variables. But, the t-values of the coefficients of DRGF and DRMM are less than its tabulated value even at 10% level of significance so that null hypothesis is accepted. Hence, these regression coefficients are statistically insignificant. The insignificant coefficients imply that those variables do not affect significantly people's participation in forest protection and management activities.

The regression output given in Table 3 reveals that the value of multiple correlation coefficient is 61.4 percent that means there is a quite good relationship among the given variables. Similarly, 49.9% of the total variation in the response or dependent variable (PPI) is explained by the variation in the given all explanatory (independent) variables. Similarly, 39.4% of the total variation in the dependent variable (PPI) is explained by the fitted regression equation (model). It means both values of R^2 and adj- R^2 is at moderate level. Thus, it can be concluded that all given determinants of people's participation in forest protection and management activities are at satisfactory level in the study.

Again, the calculated F-value for overall goodness of fit of the model is greater than its tabulated value ($F_{cal} > F_{tab}$) at 5 percent level of significance. Hence, it could be concluded that the regression equation is statistically significant by rejecting null hypothesis of the study. Moreover, the calculated D-W value of the model is less than its tabulated value ($D-W < d_L$) at lower level at 5% level of significance. This suggests that the error terms are positively auto-correlated.

CONCLUSION

People's participation has been recognized as a key element and essential part in natural resource management like forests. As people are highly dependent upon forests and forest products for their livelihood, they do more participate in forestry programmes. However, the willingness to participate in forest protection and management work is generally depends upon growing shortage of forest products, suitable forest policy and legislation of government. If people are assured that they are getting sustainable

benefits from the forests both in short and long term, people will easily participated. But if the government fails to give assure to people about it, there will be less participation. Local people should be involved not only in the form of physical standing but also in managerial level of decision making. The nature and level of people's participation is highly determined by size of land holding (SLH), number of livestock keeping (NLSK), total household members (THM), distance between residence and community forests (DRCF), gross household income (GHY) and overall forest condition (FDI). The role of forest department should be as a partner, advisor, facilitator and more technical supporter. Moreover, the role of I/NGOs and other stakeholders should not be ignored as advisor and facilitator in forestry programmes for effective participation of people. However, the major challenges of people's participation is how to make meaningful involvement of local people in better forest protection, management and sustainable development so that they will get sustainable economic benefits for livelihood, environmental protection and ecological balance.

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