

**Externalities and Distributional Implications of
Community Forest Management:**

A Case of Arun River Valley

A Dissertation

**Submitted to the Faculty of Humanities and Social Sciences of
Tribhuvan University in Fulfillment of the Requirement for
the Degree of Doctor of Philosophy in**

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By

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LETTER OF RECOMMENDATION

We certify that this dissertation entitled **Externalities and Distributional Implications of Community Forest Management: A Case of Arun River Valley** was prepared by Mr. Mahesh Raj Dahal under our guidance. We hereby recommend this dissertation for final examination by the Research Committee of the Faculty of Humanities and Social Sciences, Tribhuvan University, in fulfillment of the requirement for the Degree of DOCTOR OF PHILOSOPHY in ECONOMICS.

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APPROVAL LETTER

This dissertation entitled **Externalities and Distributional Implications of Community Forest Management: A Case of Arun River Valley** was submitted by Mr. Mahesh Raj Dahal for final examination by the Research Committee of the Faculty of Humanities and Social Sciences (FOHSS), Tribhuvan University (T.U.), in fulfillment of the requirements for the Degree of DOCTOR OF PHILOSOPHY in ECONOMICS. I hereby certify that the Research Committee of this Faculty has found this dissertation satisfactory in scope and quality and has therefore accepted it for the sought degree.

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ABSTRACT

The equity issues of community-based forest resource management have become major areas of disputed discussions in recent years. This study entitled **Externalities and Distributional Implications of Community Forest Management: A Case of Arun River Valley** tries to examine the contribution of community forestry to household-level benefits (income) and costs with emphasis on different caste and income groups focusing equity in benefit/cost distribution. This study aims to contribute towards the understanding of rural poverty-natural resource relation vis-à-vis the victim hypothesis, equity issues and externalities of community forest management. The primary objectives of this research study are: 1) to review the theories of development and poverty environmental/natural resource nexus 2) to analyze institutional mechanisms, property rights and distributional rules of community forest management 3) to verify empirically the victim hypothesis that whether those rural poor and lower caste or non-poor and high caste households depend more on natural community forest resources 4) to examine the equity and externality issues of management of common property forest resources by employing benefit-cost analysis and 5) to provide suggestions for policy issues.

The study was under taken in three Village Development Committees (VDCs) from Bhojpur district and one VDC from Dhankuta district of lower Arun River valley including a total of sixteen Community Forest User Groups (CFUGs). Compiling a census of all households under the sixteen community forest user groups, a Participatory Rural Appraisal (PRA) technique was applied with focus group discussion meetings held at each CFUG to distinguish all the households into four caste/ethnic and three income groups for realistic assessment of poor and non-poor households based on multidimensional local criteria and to reach consensus regarding user's price and barter game prices of different forest products, working hour in a day and average daily wage etc. Based on identified households by the PRA group discussions, a stratified sample of 400 household out of total 1224 household was chosen for household survey from October 2002 to March 2003. The household sample represented about average of 32 percent of total households from each CFUG vis-à-vis of each caste/ethnic and income groups of households in a proportional basis of the study area as a whole. The standard methods/formulas were designed to calculate the household level gross and net benefits from and gross costs including labour cost, transaction costs and cash expenditure of use and management of community forests. A multiple regression model was used with seventeen explanatory variables and household level income from CF as dependent variable to understand the relationship between forest dependency (household level income from CF or value of outputs) and socio-economic determinants. In addition to

primary data, the other necessary secondary information has been used as and when necessary.

Based on PRA technique, the study had found out that *Janajati* group had more poor households (48.7 percent) followed by *Dalit* (41.9 percent), *Newar* (33.3 percent) and the *Brahmin/Chhetri* (23.4 percent) respectively. Two major types of forest products, consumption based and production based forest products were observed in the study area. The existing local institutional base and distributional rules of community forestry was found to be unable to distribute the common property forest resources and provide a significant contribution to the livelihood of poor and marginalized people.

In terms of absolute dependency or contribution of Community Forest (CF), the *Newar* households obtained much more gross and net income from CF/year (NRs 6,393 and NRs 2,229) than the *Brahmin/Chhetri* (NRs 5,837 and NRs 1541), *Janajati* (NRs 5,370 NRs 1,714) and the *Dalit* (NRs 5,108 and NRs 1,413) respectively. Per year gross household income from CF was far less for the poor income groups NRs.3, 236 (18.6 percent) than the rich NRs. 7, 786 (44.7 percent) and the medium income groups NRs. 6,397 (36.7 percent) respectively. The study findings suggested that in absolute term, *Newar* and *Brahmin/Chhetri* households were more dependent on community forests than the *Janajati* and the *Dalit* and non-poor households were more dependent on community forests than the poor households. In terms of relative dependence, gross and net income from CF as a percentage of total non-CF cash income was lower for *Brahmin/Chhetri* households (14.0 percent and 3.7 percent) than the *Newar* (21.8 percent and 7.6 percent), *Dalit* (16.6 percent and 4.6 percent) and the *Janajati* (14.1 percent and 4.5 percent). Similarly, gross income from CF as a percentage of total non-CF cash income was lower for non-poor households (13.1 percent) and middle-income (15.6 percent) than the poorer households (18.2 percent). On the contrary, the poorer households had lower net CF income (3.2 percent) as percentage of total non-CF cash income than the non-poor households (4.7 percent). This means, in relative term, *Newar* and the *Dalit* households were more dependent on community forests than the *Janajati* and the *Brahmin/Chhetri* households and poor income households were more dependent on community forests than the non-poor households, findings that some contradict and some support the results from the other similar studies.

Average gross value of forest used and cost of management for each of the *Brahmin/Chhetri*, *Newar*, *Janajati* and the *Dalit* caste/ethnic groups were NRs 5,837 and NRs 4,297, NRs 6,393 and NRs 4,164, NRs 5,370 and NRs 3,656 and NRs. 5,108 and NRs 3,694 respectively. The difference between average household gross value and cost or the average per household net benefits for *Brahmin/Chhetri* household was NRs

1,540, *Newar* NRs 2,229, *Janajati* Rs 1,714 and the *Dalit* Rs 1,414. This means the average percentage differences of household level benefit and cost i.e. net benefits of CF was positive for *Newar* ($28.2-26.3 = 1.9$) and *Janajati* ($23.6-23.1=0.5$) and it was negative for the *Brahmin/Chhetri* ($25.7-27.2 = -1.5$) and the *Dalit* ($22.5 -23.4 = -0.9$). Hence, the benefit–cost ratio (B/C) for the *Newar* and the *Janajati* household was more than one (1.07 and 1.02) and it was less than one for the *Brahmin/Chhetri* and the *Dalit* households (0.94 and 0.96). Similarly, the average percentage differences of household level benefit and cost i.e. net benefits of CF was positive for the rich ($45.0 - 41.0 = 4.0$), zero for the middle-income ($37.0 -37.0 = 0$) and negative for the poor income group of households ($22.0-18.0 = -4.0$) respectively. Consequently, the benefit–cost ratio (B/C) for the rich households was more than one (1.09), middle-income households (1.0) and the poor income household (-0.81).

Thus, as per the results of benefit-cost and externality analysis the *Brahmin/Chhetri* and the *Dalit* households had failed to internalize the benefit from CF as per the total gross cost incurred by them. The *Newar* and the *Janajati* households were able to internalize the benefit from CF by externalized the total gross cost on the *Brahmin/Chhetri* and the *Dalit* households. On the other hand, the poor income households failed to internalize the benefit from CF as per the total gross cost incurred by them. The middle incomes households were able to internalize by equalize both of gross benefit and the gross cost. The rich income households were able to externalize the gross cost on the poor income households to gain disproportionate net benefits from CF. Thus, it is concluded that in case of benefit accrued (positive externality) and gross cost incurred (negative externality) of CF use and management by different caste/ethnic and income groups of forest users' households, the externalities of CF had not created equity efficiencies within and between the caste/ethnic and income groups of households in the study area.

Although, the environmental value by vegetation cover (bio-physical condition) of forest resources were found remarkably enhanced since the forest resource management regime shifted from state to local community participatory management, however, due to the lack of relationship about different linkages between rural poverty and environmental/natural resources, equitable distribution of forests resources within the rural community especially across the disadvantaged and marginalized groups of people has not been clearly demonstrated. Thus, this study raises the concern of whether conservation-oriented measures that promote regulated systems of forest management in Nepal undermined social goals such as equitable distribution of benefits and costs among the forest dependent households. It is reasonable to require that policies aimed at allocating forest resources should not eschew equity concerns altogether. The study had made a number of recommendations to improve community forest management and

equity in benefit-cost distribution in Nepal which include, class and income dichotomy concept of poverty should shift towards across the socio-demographic and economic indicators to define rural poverty, representation on the Forest User Executive Committee (FUEC) should at least be proportional based on inclusion of caste/ethnic and gender, provision of membership possession should be in only one CFUG, CFUG fund should divert to income/employment generation, the existing monitoring systems and practices of CF should considered equity in forest products sharing, the taxation on commons (forestry sector) should impose on the basis of per household net benefit and the benefit–cost ratio, provision of leasehold community forestry and private property options should introduced in CF, and the government should encourage of co-investment between multi sector stakeholders for more production of forest products within the CF.

Since this study could not compare pre and post impact of CFs on household income and cost. Further comparative study on organizational development processes of CFUGs, participatory action research for various ecological belt and socio-economic circumstances and explore market and forest product development potential at commercial (beyond subsistence) levels based on time series information would contribute to a richer analysis on the complexity involved in poverty, inequality and distributive consequences of regulated forms of CPR regime and all these may help comprehensive understanding about dependency and externalities issues of community forestry.

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Acronyms and Abbreviations

CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CBPE	Community-Based Population control and Environmental management
CBS	Central Bureau of Statistics
CF	Community Forest
CFUG	Community Forest User Group
CIFOR	Central for International Forestry Research
CPR	Common Property Resource
CV	Contingent Valuation
DFID	Department For International Development
DFRS	Department of Forest Research and Survey
DOF	Department of Forest
FAO	Food and Agriculture Organization
FPC	Forest Protection Committee
FUC	Forest User Committee
FUEC	Forest User Executive Committee
FUG	Forest User Group
GDP	Gross Domestic Product
GEMINI	Growth and Equity through Micro Enterprise Investments and Institutions
HDR	Human Development Report
HMG	His Majesty Government
ICIMOD	International Centre for Integrated Mountain Development
IFAD	International Fund For Agricultural Development
JFM	Joint Forest Management
LRMP	Land Resource and Map utilization Report
MOPE	Ministry of Population and Environment
NESAC	Nepal South Asia Centre

NGO	Non-Government Organization
NLSS	Nepal Living Standard Survey
NPC	National Planning Commission
NRM	Natural Resource Management
NRs	Nepalese Rupees
NTFP	Non-Timber Forest Product
OLS	Ordinary Least Squares
POLSAN	Political Science Association Nepal
Ph. D.	Philosophy in Doctor
PRA	Participatory Rural Appraisal
PRSP	Poverty Reduction Strategy Paper
RDCs	Rural District Councils
SAARC	South Asian Association for Regional Cooperation
SANDEE	South Asian Network for Development and Environmental Economics
UK	United Kingdom
UNDP	United Nation Development Programme
US	United State
US\$	United State's Dollar
VDC	Village Development Committee
WTP	Willingness To Pay