Master's Thesis

Economic Contribution of Forest Products to Rural Livelihoods in Northern Mountainous Villages, Vietnam

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ABSTRACT

Title of the Master's Thesis	Economic Contribution of Forest Products to Rural Livelihoods in Northern Mountainous Villages, Vietnam

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Economic importance of forest products to the rural livelihoods has been enlightened by a significant number of empirical studies. However, current literature often focuses on the proximity of natural forests, which are, in most of the cases, under the management of communities or states. Household managed forests, where local people often actively engage in forest plantation, have been being promoted in developing world for the sake of both poverty alleviation and forest conservation. Yet, evidences about economic significance of forest products as well as factors determining household decisions on forest activities in such setting remain limited.

This study captures the economic contribution of forest products to household income in the context of household managed forests by analyzing a dataset of 308 households in two villages of Bac Kan province, located in the northern mountainous region of Vietnam. Household income is measured in cash income per adult equivalent unit, and comparisons among cash income quartiles as well as income sources are performed by ANOVA tests and post-hoc tests. In addition, determinants of household engagement in forest activities are examined by Tobit models. Equally important, a forest survey is also conducted so as to investigate basic biological status of household planted forests.

Results show cash income from forest products accounts for about 20% of household cash income, which surpasses cash contribution of all other livelihoods but that of livestock cash income and off-farm wages. In addition, although higher absolute forest cash income is witnessed in short-run better-off group, no significant difference is seen in the relative forest income among cash income quartiles. Importantly, among forest products, timber is the biggest contributor. Tobit models demonstrate positive correlations of cropland area with forestland holding as well as plantation area. Furthermore, older-headed families, although having larger forestland and plantation area, derive less cash income from forest products and show less dependency on forest cash income. Meanwhile, education level of the household head is negatively correlated with forestland area, absolute forest income and relative forest income. Finally, the biological status of household planted forests is concluded to be undiversified. Only seven species are found, and two fast-growing species, *Magnolia conifer* and *Acacia hybrid*, account for more than 90 percent of the sample. Tree height and tree trunk diameter show concentrations in low-value classes due to relatively similar and short plantation durations among households.

Findings of the study function as an empirical support for poverty reduction based household managed forests. Correlation analyses from Tobit models prove the viability of a combination between agriculture and forestry as an economic development policy. However, increasing education level are potential obstacles for the current forest-based development. Hence, new high-return forest products which are attractive to people of all education levels need developing. Last but not least, diversification of planted tree species should be taken in consideration.

1 INTRODUCTION

Relationships between forests and rural livelihoods have been being investigated worldwide for the sake of forest-based poverty alleviation. Evidences from various regions have proved the economic importance of forest sources to the rural poor. Quantitatively, contribution of forest products to household income, on a global average, is reported at approximately 22 percent (Angelsen et al., 2014), with the poor are generally more reliant on forest income than the better-off (Babulo et al., 2009; Cavendish, 2000; Rayamajhi, Smith-Hall, & Helles, 2012; Vedeld, Angelsen, Bojö, Sjaastad, & Kobugabe Berg, 2007). In addition, there are ample attempts to model factors that influence household dependency on forests as well as household decision-making for forest related activities (e.g. Fisher 2004; Adhikari et al. 2004; Rayamajhi et al. 2012; Sikor & Baggio 2014; Babigumira et al. 2014; Ashraf et al. 2015). Results show that many household characteristics are significantly correlated with forest-related decisions as well as forest income.

Nonetheless, most of the study sites have so far concentrated on state or community managed forests, where environmental products from natural forests often play a key role. In a result of their global-scale study, Angelsen et al. (2014) report that among 22 percent contribution of forest sources to household income, 21 percent is from natural forests and only 1 percent belongs to plantation. Meanwhile, in the context household-based forests management, where active plantation is prevalent, little is known. In fact, planted forests managed by households are increasing rapidly, especially in developing regions (FAO, 2006). Accordingly, on global average, proportion of planted forest area managed by smallholders rose nearly threefold in 15 years, from 12% in 1990 to 27% in 2000 and to 32% in 2005. This ratio far exceeded that of corporate ownership, which by contrast witnessed a downward patterns. Moreover, the dramatic rising importance of smallholders was particularly seen in East Asian and some South East Asian countries. These numbers demonstrate clearly that planted forests managed by

households is an emerging type of forest management, offering a compelling contextual setting forest poverty relationship studies.

Similarly, in Vietnam, studies on economic contribution of forests are clustered in the proximity of natural forests, which are under state or community management (e.g. Mcelwee 2008; Viet Quang & Nam Anh 2006). Whereas, FAO reported a significant increase in national smallholder ownership of forest plantation to 64% in 2005, which was more than double public ownership (FAO, 2006). Allocation of forestland to household has been being promoted for decades in Vietnam. Because of a weak management of State Forestry Enterprises (SFEs) and a need for productive land of local people in disadvantaged regions in the 1980s, forestland ownership was shifted gradually from the state to individuals (i.e. households) (Sandewall, Ohlsson, Sandewall, & Sy Viet, 2010; Sikor & Nguyen, 2007). Such forestland devolution is aimed to achieve both poverty reduction and conservation of forest coverage. Nonetheless, economic contribution of available products from household-managed plantation forest remains ambiguous.

Inconsideration of this inadequate understandings, the study aims at quantitatively evaluating the economic benefits from household-managed forests using a dataset of 308 households generated from a survey in poor mountainous villages of Vietnam. Moreover, Tobit models are utilized so as to examine the determinants of household engagement in forest activities. Last but not least, biological status of household planted forest is investigated via a forest survey.

The rest is organized as follows. After study objectives and research questions are clarified in section 2, section 3 provides a review of literatures about economic contribution of forest products as well as studies on factors affecting household involvement in forest activities. Study area and methods are described precisely in section 4 and section 5 respectively. Section 6 presents results from statistical analyses. Section 7 discusses, and section 8 concludes and gives policy implication for decision-makers.

2 STUDY OBJECTIVES

With a view of examining the relationship between rural livelihoods and household-managed forests, the study is to achieve three objectives as the followings:

Objective 1: To quantitatively evaluate the economic contribution of products from household managed forests to rural livelihoods in mountainous villages of Vietnam

Objective 2: To identify determinants of household's engagement in forest activities

Objective 3: To investigate biological status of household planted forests

In order to achieve the aforementioned objectives, the study is designed to answer 3 following research questions:

Question 1: To what extent do products from household managed forests contribute to household income in mountainous villages?

Question 2: Among household characteristics, what have significant impacts on household forestland holding, plantation size and forest income?

Question 3: How is the biological status of planted forests managed by households?

3 LITERATURE REVIEW

3.1 Economic contribution of forest products

A range of quantitative studies on economic importance of forests have emerged in the last two decades. While some of them mainly focus on environmental products from forests, some are designated to capture all forest-related sources from non-cultivated, processed products, plantation to forestry wages.

Forests offer a range of products for people living in the proximity, such contribution is however often omitted by national economic datasets (Cavendish, 2000). Moreover, the relationship between the poor and forests are controversial as forest sources have both the advantages and disadvantages for poverty alleviation (Angelsen & Wunder, 2003). Based on those arguments, researchers started to comprehensively quantify economic role of forest-related income. Cavendish (2000), utilizing a panel data collected in Zimbabwe, demonstrates that environmental sources from forests account for about one third of total rural household income. In addition, environmental income is more important for poorer households with approximately 40 percent of their total income coming from non-cultivated sources. Meanwhile, larger absolute environmental income is witnessed in the richer groups. Not only is Cavendish's work one of the first publications to report the contribution of environmental goods, it does introduce methods to quantitatively evaluate income from those easily omitted products. In particular, evaluation difficulties often lie in products that are not traded or battered on the market. According to Cavendish's methods of evaluation, implicit prices for those products are either household assigned values, whenever they are possible, or close and locally-traded substitutes. In addition, for the sake of comparability of income across household, income per adjusted adult equivalent unit (aeu) is proposed. Another pioneering and more forest-oriented study is conducted by Fisher (2004). Using data collected in rural Malawi, the author sheds light on the substantial reliance on forest income, representing about 30 percent