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Importance, determinants and gender dimensions of forest income in eastern highlands of Ethiopia: The case of communities around Jelo Afromontane forest

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ABSTRACT

Rural households across developing countries rely on diversified sources of income, and forest resources play important role in this regard. This study was designed with the objectives of assessing the contribution of forests to annual income of rural households and identifying its determinants using the case of Jelo Afromontane forest in eastern Ethiopia. It also examined the gender dimensions of forest income, and how this income varies with the wealth status of households. Key informant interview, focus group discussion and household-based questionnaire survey were used to collect data. On average, income from crop production accounted for 40.7% of the total annual household income. Forest income was second in importance, contributing 32.6%. Income from livestock, off- and non-farm activities, and woodlots accounted for 13.6%, 11.4%, and 1.7% of the total household income respectively. Firewood was the most used forest product and constituted the largest proportion (79%) of the total forest income. The contribution of forest income to the total household income varied significantly ($P<0.05$) with wealth category. Forest income was more important for poor households (47.3%) than for medium (30.5%) or rich (20.2%) households. It was also more important for female headed households (58.2%) than for male headed households (29%). The gender dimension of forest income was also apparent within the household. Female members generated about four times more forest income (77% of the household forest income) than male members (23%). The sex of the household head ($P<0.01$) and distance to the forest ($P<0.05$) were the two determinant variables that significantly affected forest income out of the eight explanatory variables considered in the regression model. Policy to promote new forest management arrangement such as participatory forest management (PFM) in Jelo forest needs to take into account the major forest users and the types of products they depend on, and be accompanied with other poverty reduction measures so that improved forest conservation outcome will not have negative consequences on local livelihoods, particularly on poor and women, who depend most on the forest.

1. Introduction

Rural households rely on diversified sources of income, both agricultural and non-agricultural for their livelihoods. Empirical investigations on the importance of non-agricultural sources of rural household income underline their relative importance (e.g. Cavendish, 2000; Vedeld et al., 2004), but their contributions are regularly overlooked in poverty surveys (Cavendish, 2000; McConnell, 2008). Given the increasing risk climate change and climate variability pose on agriculture, enhancing and sustaining income from non-agricultural activities would strengthen adaptive capacity of farming communities.

Among the non-agricultural resources that support livelihoods of millions of people throughout the world, more importantly those in the developing countries are forests. Globally some 350 million people are directly dependent on forests for their survival (World Bank, 2006), and many more depend on these resources to earn additional income. Forests offer the provisioning services to the poor especially during times of need; hence add to rural peoples' livelihood security (Vedeld et al., 2004; Shackleton et al., 2007). Forest products collection and sale could also support the efforts of poor households to accumulate assets and also to invest towards a more secure livelihood, for example, through educating children, purchasing agricultural inputs, or investing capital on activities that would generate additional income.

On the other hand, some scholars (e.g. Angelsen and Wunder, 2003; Belcher et al., 2005) have raised doubts on the potential of forests in poverty alleviations, arguing that this potential is apparently small. This conclusion has been, however, challenged by many authors. For instance, Shackleton et al. (2008) reported employment in informal and formal forestry sector helps in moving households out of poverty. Likewise, LóPez-Feldman et al. (2007) and Tesfaye et al. (2010) demonstrated that forest income could raise the income

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levels of poor households to be closer to the level of the wider community.

Benefits from forests, however, vary with households depending on their socio-economic characteristics (e.g. wealth status; family size in general and composition of female and male members in a household; education level, sex and age of the household head), access to forests, access to markets, institutional arrangements governing access to forests and marketing channels, and off-farm employment opportunities (Carter and Gronow, 2005; Abebaw et al., 2012). Forest income is particularly important to the poor. Generally poorer households derive greater proportion of their income from high volume low value forest products than do wealthy households. With increasing wealth, households tend to purchase forest products than collecting by themselves (Escobal and Aldana, 2003; Shackleton and Shackleton, 2006).

Gender is also an important factor to consider when studying forest dependence (Ruiz-Perez et al., 2002). Gender roles can be seen at two different levels: between female and male members within a household and between male headed and female headed households. Within households, men and women often do have differing roles and responsibilities with respect to the collection, processing and marketing of forest products. In most developing countries meeting household food and fuel needs, including generating the income needed to provide these necessities, has generally been seen as the responsibility of women (Neumann and Hirsch, 2000; Prema, 2002). Men, on the other hand, are the primary harvesters of high value products such as timber that are procured deep in the forest or require hard physical labor (Clarke et al., 1996).

Moreover, women in general have less access to credit (e.g. to buy farm inputs such as fertilizers and improved seeds), extension services and improved technologies (World Bank, 2008). This forces them to depend heavily on natural resources notably forests (Djoundi and Brockhaus, 2011). In sub-Saharan Africa in particular women from the poorest households obtain major source of their subsistence from a diverse set of forest products (Timko et al., 2010). A study of 25 markets in the humid forest zone of Cameroon showed that 89% of NTFPs traders were women (Awono et al., 2010). According to a study in Uttar Pradesh in India, women derive 45% of their income from forests and common lands as opposed to only 13% for men (FAO, 1996).

In spite of the large body of literature on people–forest relationships, a review by Byron and Arnold (2005) raised a number of key questions that are yet to be answered. Some of these questions revolve around the characteristics of the users, the amount of benefit flows, and whether the benefit is from forest proper or trees managed outside forests. Thus, additional empirical researches on the level of people's dependence on forests, the characteristics of dependent households and factors determining their levels of dependence are still essential areas of research to be looked into across different geographic locations. The objective of this study was to determine the contribution of forest to the annual income of households around Jelo Afromontane forest in the eastern highlands of Ethiopia. The study aimed to address the following questions:

- What are the major sources of income for the households in the study area?
- What is the actual and relative contribution of forest income to the annual household income?
- How does forest income vary with socio-economic status? And what types of forest products are particularly important to the poor?
- What factors affect households' dependence on forest income? And how does gender factor (composition of females and males within a household and gender of the household head) affect dependence on and level of forest income?

In line with the objective and research questions, the assumptions of the study were: (i) forest products make important contributions to the annual income of communities living around the forest, and (ii) socio-economic parameters, including gender influence the relative importance of forest income.

2. Methodology

2.1. The study area

The study was conducted in selected villages surrounding the Jelo forest in eastern Ethiopia. The forest is located between 40° 45′and 40° 52′ East longitude and 8° 55′and 9° 02′ North latitude. It is close to Chiro town, the capital of West Hararghe Zone administration (Fig. 1) some 325 km east of Addis Ababa. The altitude ranges between 1500 and 3074 m a.s.l. The area is characterized by a bimodal rainfall distribution with the average annual rainfall of 577 mm. The mean daily temperature ranges between 15.3 and 26.9 °C (National Meteorological Agency, NMA, 2009).

Jelo forest represents the few remnant Afromontane natural forests in the Eastern highlands of Ethiopia. It is one of the 39 high conservation value forests identified as high priority regional forest areas in the Oromia National Regional State. The forest is also unique as a transitional forest type between the Afromontane rainforest and the dry evergreen forest. In response to severe deforestation and degradation of the Jelo forest, the Oromia Forest and Wildlife Enterprise (OFWE) in collaboration with the German agency GIZ (*Deutsche Gesellschaft für Internationale Zusammenarbeit*) are attempting to introduce a Participatory Forest Management (PFM) scheme that will engage communities in forest management and in return recognizes community's use rights of forests for better conservation and livelihood outcomes (Anonymous, 1990). By interviewing community members residing in the villages around the forest, attempt was made to understand the existing community–forest interaction in terms of the role the forest is playing in local livelihood strategies. The findings of the study are expected to provide essential information and additional insights that would be used in facilitating successful implementation of the PFM scheme in the study area and elsewhere.

2.2. Data collection and analysis

Key informant interviews, focus group discussions and household-based questionnaire survey were used to collect the required data. Discussions with the experts of the Hararghe Branch Office of Oromia Forests and Wildlife Enterprise (OFWE) and Chiro District Office of Agriculture revealed that the total number of kebeles (the lowest administrative unit in Ethiopia) surrounding Jelo forest was five. Out of the five kebeles, three were randomly selected for the study. From villages within each kebele, two were selected randomly. Furthermore, with the help of Government extension workers (known as development agents) and kebele administration officials, two key informants per village were identified and a total of 12 key informants were interviewed. Eight focus group discussions (with 2 women and 6 men groups) were also conducted to gather mainly qualitative information on major rural livelihood activities, forest dependence, household's risk minimization strategies and existing forest management system. The key informant interviews and focus group discussions were led by the researchers. During the focus group discussions participants were encouraged to talk freely and spontaneously but the discussions were guided and covered specific topics such as income sources, how women and men within households are engaged in various income generating activities, main types of forest products collected and the time of the year when people depend most on the forest products. The information generated was used both to guide the focus of the formal survey and also to cross check the results from the formal survey.

Quantitative data were collected using the household based questionnaire. Sample households were selected using a multistage