The Role of Forest for Rural Livelihood Diversification in Ethiopia

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Forest resource is believed to diversify rural livelihood by driving a range of products and services. However, until recently evidence in the forest literature supporting these perceived benefits has been scarce. Thus the current review paper brings together a series of scientific papers from around Ethiopia to address recent findings on rural livelihood diversification contribution of forest. Forest diversifies rural livelihoods living in and around the forest surrounding through supplying direct products such as fuel wood, wild fruit, honey, and timber and by selling and consuming other woody and non-woody products. In addition, forests also generate formal and informal employment opportunities and provide environmental services that support the sustainable operation of other sectors. From the dryland forests of Ethiopia, households earn a significant amount of income for their livelihoods improvement and considerable employment opportunities. The level of forest use and the degree of reliance on forest products differ across the wealth and gender status of the households. Forest income was found more important for poor households than for medium and rich households. Female members generated about four times more forest income than male members in the Jelo Afromontane forest. The current review paper result also shows woody and non-woody products of forest provide natural insurance to rural communities in the form of alternative sources of income and subsistence in times of unexpected shocks e.g. floods, drought, and economic misfortune. Forest income also helps some of the rural households to remain above the poverty line. Generally, forest diversifies the rural livelihood condition and should be considered in policy decision making.

Keywords: forest, gender empowerment, income, livelihood diversification, poverty alleviation

INTRODUCTION

Forest resources in the Ethiopian context comprise natural high forests which are characterized by woodlands, bush lands, plantations and on-farm trees (Keenan et al., 2015). Recent data on the forest resources (Keenan et al., 2015) documented in FAO’s Forest Resources Assessment (FRA), places Ethiopia among countries who have forest resource cover ranging between 10 to 30% and estimated to cover close to 12.4 million hectares or 11.5 % of the country’s total land area. Those forest resource in Ethiopia, diversify rural livelihoods particularly to the poor households living in and around forest area by providing direct products such as, fuel wood, wild fruit, honey, construction materials, timber (Tadesse et al., 2014; Fikir et al., 2016; Yasin et al., 2018), crafts, gum and resin, etc (Lemenih et al., 2003). Forest also play significant role in rural livelihood diversification through supplying environmental services like soil and water conservation (Woldie and Tadesse, 2019). In the current review paper, rural livelihood diversification shall be defined as individuals or households activities to find the better ways to increase income and reduce environmental related risk, that differ by the degree of freedom of choice to diversify for the reversibility of the outcome (Liu & Liu, 2016) and increase
means of gaining a living (Alobo 2015) through diversifying their income from forest in this review paper context. In this regard, the study by (Fikir et al., 2016) in Hammer district and (Asfaw et al., 2013) in the Jelo Afromontane forest in eastern Ethiopia, show that forest products contribute 21.4% and 32.6% of the total annual household income respectively in the studied areas. From dryland forests of Ethiopia, households also earn a significant amount of income for their livelihoods improvement (Lemenih & Teketay, 2004) and considerable employment opportunities from the forest resource (Eshete et al., 2005).

The level of forest use and the degree of reliance on forest environmental products, however, differ across wealth status of households (Babulo et al., 2008) and gender status (Asfaw et al., 2013). In line with this, forest income was significantly (P < 0.05) more important for poor households (47.3%) than for medium (30.5%) and rich (20.2%) households in eastern Ethiopia (Asfaw et al., 2013). This is because, poor households since do not have enough farmland or other assets for capital reserves to build up enterprises based on the production and harvesting and marketing of NTFPs once or twice a year (Wood, 2007), they will use and utilize the forest resource as the source of additional land. Regarding the role of forest income in gender participation importance, a study by (Asfaw et al., 2013) the Jelo Afromontane forest reported that female members generated about four times more forest income (77%) than male members (23%): indicating that forest products play an important role for female headed households. Female households also engaged and benefited by earning forest income through collecting and selling charcoal and fuel wood from the Menagesha Suba forest in the Oromiya region (Duguma et al., 2015).

The above-mentioned different goods and services provided by the forest can be a means of poverty alleviation during resource shortages together with agricultural crop production particularly for poor rural households through diversifying their livelihood conditions (Yemiru et al., 2010). In times of economic misfortune, forests can serve as reserve areas for agricultural conversion, sources of emergency cash income (as a safety net), and a foraging resource (Noack et al., 2015). Research conducted on the economic contribution of forests resource use to rural livelihoods in Northern Tigray (Babulo et al., 2008), shows incorporating forest environmental incomes in household accounts significantly reduces measured rural poverty and income inequality. Furthermore, (Yemiru et al., 2010) also confirm that forest income helps 20% of the population to remain above the poverty line and forest income derived from diversified products and services alleviates poverty. Despite forests significantly contributing to rural livelihood diversification roles, its resource have been seriously undervalued, their livelihood importance is still overlooked in national policy, and management is focused more on humid forests (Woldie and Tadesse, 2019) and even little attention is given to the multiple benefits that forests provide other than timber products. Just by illustrating the importance of forest resources either directly or indirectly, to rural livelihood diversification one can reflect the true social costs to reduce market distortions and reduce the welfare losses of forest ecosystem degradation. Even the benefits of conservation can be more adequately represented in the process of making trade-offs by both private land managers and public policymakers. In addition, forest livelihood diversification valuation would have the potential to reduce the conflict between development and conservation goals. Failure to disseminate that information could result in, not using the full potential of forest resources as an effective approach to sustainable production and ecosystem service delivery. Then, success stories of forest resources for local community livelihood diversification become localized just not written up or widely published. Therefore, the general purpose of this review paper is to evaluate the role of forests in rural livelihood diversification. The paper also specifically seeks; the contribution of forests to rural livelihood income diversification, its importance to female empowerment, forest benefit as a safety net during resource shortage, and poverty alleviation.

**Literature review**

**Concept and definition of rural livelihood diversification**

There have been different definitions and concepts of rural livelihood diversification in the existing literature. In the current review paper, rural livelihood diversification is defined as individuals’ or households’ activities to find the better ways to increase incomes and reduce environmental related risk, that differ by the degree of freedom of choice to diversify for the reversibility of the outcome (Liu and Liu, 2016) and increase means of gaining a living (Alobo 2015). According to (Martin and Lorenzen, 2016) livelihood diversification is conceptualized as rural households engaging in a diverse portfolio of activities and capabilities of social support in their struggle for survival and improvement in their standard of living. In defining the word livelihood diversification, we need to refer again to livelihood strategies which are the combination of activities that people choose to undertake to achieve their livelihood diversification goals (Ellis and Allison, 2004). Whereas, Livelihood activities are actions taken by the household to obtain household income. There are different methods of identifying livelihood strategies; but most commonly, economists group households’ livelihood strategies by shares of income earned from different sectors of the rural economy (Brown et al., 2006).

The reason for rural household livelihood diversification
as described by (Kassie 2017) is self-insurance against risk, farmers’ livelihood diversification where there are incomplete product markets, and households’ inability to specialize due to incomplete factor markets. (Gebru and Beyene, 2012) added better incentives for allocating labour to non-farm activities, and inadequate farm output, leading to a need for non-farm income source diversification to purchase farm inputs. Households could also diversify their livelihood to respond to the lack of capital assets or food through processes that drew on more readily available capital assets (Manlosa et al., 2019). In this support, previous empirical study conducted by (Alobo 2015) reports that rural households across developing countries share 30–40% of their total income from non-farm sources. In Ethiopia, also empirical studies indicated that non-farm income accounts range from 40–45% of the average household’s income (Aaababbo and Sawore, 2016). In non-farm income sources of livelihood diversification, forest resource products play a significant contribution and are being considered as a part of this review paper.

The role of forest for rural livelihood income diversification

Forest resources in the Ethiopian context comprise natural high forests which are characterized by woodlands, bushlands, plantations, and on-farm trees (Keenan et al., 2015). Recent data on forest resources (Keenan et al., 2015) documented in FAO’s Forest Resources Assessment (FRA), places Ethiopia among countries that have forest resource cover ranging between 10 to 30% and cover close to 12.4 million hectares or 11.5% of the country’s total land area. Those forest resources diversify rural livelihoods by generating formal and informal employment opportunities and by providing environmental services that support the sustainable operation of other sectors. In addition through supplying direct products such as, fuel wood, wild fruit, honey, and timber and with other woody and non-woody products, forests play a significant role in rural livelihood diversification in Ethiopia, particularly to the rural communities living in and around forest surrounding (Yemiru et al., 2010). In this regard, the study by (Fikir et al., 2016) in Hammer district and (Asfaw et al., 2013) in the Jelo Afromontane forest in eastern Ethiopia, show that forest products contribute 21.4% and 32.6% of the total annual household income respectively in the studied areas. According to, the former author, the major products in the studied forest of Hammer district were honey, fuel wood, gum and resin, and crafts and construction materials, each contributing 49%, 39%, 6%, and 6% of the total forest income, respectively. Rural households living in and around the Bonga forest also collect poles, lianas, timber, firewood, fodder, wild coffee, source materials for furniture and farm implements, the traditional medicine, to diversify their livelihood (Kassie, 2017). In this forest some of the households gather grasses from the forest, through a cut-and-carry system and feed their animals mainly during the dry season. A similar study by (Adilo, 2007) in South Western Ethiopia, reported that forests contribute to local communities with an income of 96.33 USD per household from the different non-timber forest products. This is because, households responded to the lack of capital assets or food through processes that drew on more readily available capital assets (Manlosa et al., 2019)

However households diversify their income from the forest, and various socioeconomic and contextual factors were found to influence forest income and forest product use dependency (Fikir et al., 2016). Similar to other forest areas in Ethiopia, in Shshed Peasant Association in the Goba district the study by (Andargatchew, 2008) also shows 47% of the annual cash income contribution of bamboo as non-timber forest product. (Mamo et al., 2007) in Dendi District, reported that forest income contributed 39% of the average sampled household income, i.e. just almost equal to the agriculture income contribution of 40% to the same size of surveyed households. From dryland the forests of Ethiopia, households also earn a significant amount of income for their livelihoods improvement (Lemenih and Teketay, 2004) and local people also get considerable employment opportunities from forests (Eshete et al., 2005). Household asset base, market access, culture, and resources endowment of the forests in terms of stock and quality of non-timber forest product makes variation in gaining forest income to rural communities in Ethiopia (Mohammed and Inoue, 2012). Despite its multiple and varied forest benefits roles, forests have been seriously undervalued, their livelihood importance is still overlooked in national policy, and management is focused more on humid forests (Woldeamanuel 2011) and even little attention is given to the multiple benefits that forests provide other than timber products.

Benefits of Forest for Poor Rural Communities and Women’s Participation

Forest environmental resources provide substantial contributions to the well-being of many poor rural dwellers by providing different forest products and service opportunities to diversify their livelihoods. The level of forest use and the degree of reliance on forest environmental products differ across households (Babulo et al., 2008). For instance, forest income was significantly (P < 0.05) more important for poor households (47.3%) than for medium (30.5%) and rich (20.2%) households in eastern Ethiopia (Asfaw et al., 2013). A study shows that households with lower total annual income depend more on forest resource products than the higher counterpart (Fikir et al., 2016). In Dendi District, Ethiopia, forest income represents 59% of the total household income for
the poorest quintile and the contribution drops to 34% in
the case of the wealthiest households (Mamo et al.,
2007). The higher the forest income contribution to poor
households than the other counterpart as reported by
(Wood, 2007) poor households do not have enough
farmland or other assets and no capital reserves to build
up enterprises based on the production, harvesting, and
marketing of NTFPs once or twice a year, they will use
and utilize the forest resources as the source of additional
land. On the other hand medium and rich households
may have enough agricultural production to support them
and see forest maintenance as a way of diversifying their
income-generating opportunities to reduce their
risks(Wood, 2007). Rural household’s economic
reliance on a particular economic activity in general and
forest environmental resources in particular also vary
depending on the resource endowment of the household,
the household’s demographic and economic
characteristics, and exogenous factors such as markets,
prices, and technologies (Babulo et al., 2008). Poor rural
local communities living in and around the Bale
Highlands forest, Southern Ethiopia had also gained an
important sources of forest cash income and diversified
their livelihoods (Yemiru et al., 2010). However,
household characteristics such as the age of the
household head and possession of cropland together
with geographical factors like altitude and distance from
the market were found to be the most important
determinants of livelihood strategy choices for forest
resource use in the mentioned area (Yemiru et al., 2010).

Regarding the role of forest income in gender
participation importance, a study by (Asfaw et al., 2013)
in the Jelo Afromontane forest reported that female
members generated about four times more forest income
(77%) than male members (23%): indicating that forest
products play an important role for female-headed
households. It has also been reported that the women
groups in Bonga participatory forest management
(Kassie, 2017) who previously bought fuel wood from the
local market for high cost, were created a relief for their
livelihood because of the existence of the forest. The
same author stated that regardless of ethnic
belongingness, individual households in the Bonga forest
were equal with others in decision-making, benefit
sharing, membership right, voting and participation in
forest and other development activities. The special
benefit of female groups from the forest resource is that
of fuel wood collection was normally allowed in the
community forest as long as the wood was dry (Woldie
and Tadesse, 2019). Female households also engaged
and benefited by earning forest income through collecting
and selling charcoal and fuel wood from the Menagesha
Suba forest in the oromiya region (Duguma et al., 2015).

**Contribution of Forest to safety nets and food
security**

The role of forests in the provision of goods such as fuel
wood, food like fruit, medicinal plant, fodder, timber,
selling woody and non-woody products of forest, etc to
rural communities could help their wellbeing and food
security during unexpected risks of drought and famine
(Palmberg-Lerche 2002). Research in developing nations
shows that those forest products provide "natural
insurance" in the form of alternative sources of income
and subsistence in times of post shocks e.g. floods, fires,
pests, and economic misfortune (Dokken and Angelsen
2015). In Ethiopia during the drought-stricken years of
1966–1969, locally referred to as "Kifu Qen" meaning
wicked days the Konso people in the Southern region
coped by increasing the consumption of wild food plants
from the natural forest (Guinand and Dechassa, 2000).
Many rural people in the country have been also reliance
upon wild food plant consumption during famine and
drought for survival (Balemie and Kebebew 2006). In
addition to this, forests’ wild edible fruits also provide
vitamins, flavourings, and compounds of nutritional,
gastronomic, and social importance which may be lacking
in the normal agricultural product of a country (Heywood,
1999) and critically important as buffers during periods of
scarcity and as nutrition for the cash poor as safety nets
(Arce 2019). In support of this fact, the study by
(Fentahun and Hager 2009) in the Amhara region
revealed a total of 44 wild fruit species rich in valuable
nutrients and is accessible year-round with significant
overlap at times of acute food and nutrient scarcity.
However, lack of capital, poor infrastructures, and less
access to credit service, and marketing services have
been some of the challenges that face rural households
not to diversify their livelihood (Kassa, 2019).

Forest resources as a safety net for rural communities
could also help by selling different forest woody and non-
woody products. In line with this, two-thirds of the
surveyed respondents’ households in the Bonga forest
(Gobeze et al., 2009) were not vulnerable during food
insecurity time because of they generate 582 ETB and
394 ETB per household per annual from selling wild
coffee and honey respectively. On the other hand, the
authors also reported that the surveyed respondents gain
annual income from charcoal 318 ETB and firewood 612
ETB respectively which could help to cope with food
insecurity. In the Blue Nile basin, found that smallholder
farmers who have a non-farm source of income were less
likely to depend on food aid and liquidate their assets in
times of climate-induced shocks (Deressa et al., 2010).
Though empirical findings have underlined the
importance of non-farm income, a very small proportion
of farmers in Ethiopia has access to non-farm income
source because of different factors (Spielman et al.,
2010). Besides to direct benefit of the forest to rural
communities, their indirect services to watershed
management, soil stabilization, and rehabilitation of
degraded lands, and as providers of shade and shelter, is
even more fundamentally important than their multiple
productive roles (Arce, 2019). Furthermore, community
and state forests found on the hillsides of Tehulederi District in South Wollo provide soil and water conservation as well as serve as natural habitats for wild animals. This notion of associating the availability of fodder, fuel wood, and construction wood as a result of land rehabilitation was common among youth, men, and women groups during resource shortages (Woldie and Tadesse, 2019).

**Beyond income diversification: the contribution of resources for poverty alleviation**

The different goods and services provided by the forest can be a means of poverty alleviation during resource shortages together with agricultural crop production particularly for poor rural households through diversifying their livelihood conditions (Yemiru et al., 2010). This is because in times of economic misfortune, forests can serve as reserve areas for agricultural conversion, sources of emergency cash income, and a foraging resource (Noack et al., 2015) Research conducted in developing countries shows that forest products contribute between 20% and 40% of total household income in forest areas, and found poor households tend to be dependent on forest resources to overcome poverty (Vedeld et al., 2007). Similarly in Ethiopia, in the Bale highlands forest income contributes to 34 and 53 of household per capita income and per capita cash income, respectively (Yemiru et al., 2010). The same author also confirms that forest income helps 20% of the population to remain above the poverty line and forest income derived from diversified products and services alleviates poverty. Households living around the Menagesha Suba forest in Oromiya Region receive below1.25 US$ a day (Duguma et al., 2015) also engage in the production of charcoal, and over 66% of the household draw monthly income from charcoal. In addition, 35% of surveyed households also reported to earn income by selling honey from these forests. Study (Hailu & Hassen, 2012) indicated that in rural Ethiopia if there had not been other sources of income including forest resources apart from agricultural production, the land scarcity by the farmers coupled with agricultural risks could not generate enough income to feed household members and they cannot fulfill household needs.

Research conducted on the economic contribution of forest resource use to rural livelihoods in Northern Tigray (Babulo et al., 2008), also shows incorporating forest environmental incomes in household accounts significantly reduces measured rural poverty and income inequality. In the Amhara region also honey-selling helps the diversification of the incomes of farmers. Some farmer beekeepers of the region reported earning up to 3000 Birr (about US$ 353) annually from honey-selling and contributing the largest portion of their annual incomes. Despite today forests play a significant contribution to poverty alleviation, a considerable magnitude of forest is encroached on due to factors arising from outside the forest landscape. This is because of the different investment schemes that take part in the forestlands and the urban and peri-urban wood demand impacts that often create an indirect pathway of influencing forests (Duguma et al., 2015).

**CONCLUSION AND RECOMMENDATION**

According to this review paper forest income diversifies rural livelihoods, particularly to the rural communities living in and around the forest surrounding through supplying a range of benefits. Rural households earn a significant amount of forest income for their livelihood improvement and considerable employment opportunities. The level of forest use and the degree of reliance on forest products differ across the wealth status of households and gender status. Forest income is more important for poor households than for medium and rich households. Forest products play an important role in livelihood diversification for female-headed households. Incorporating forest incomes in household accounts significantly reduces rural poverty and inequality and makes some rural households to remain above the poverty line.

To end poverty and diversify household livelihood government would give due attention and put the right policy measures in place that support factors affecting forest livelihood diversification as part of national job creation for saving the life of many poor rural people. Governments would also need to further develop policies that secure equal benefit sharing for the poor and vulnerable, including indigenous people, landless farmers, rural women and youth. These policies should facilitate access to markets and better prices by accessing the formal economy, payment for ecosystem services (PES), credit, and other sources of financing, for the better livelihood improvement of forest to households.

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