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Original Article

Contribution of Non-Timber Forest Products to Local Communities: The Case of Belete Gera Forest, Southwest Ethiopia

Abera Adugna Bayesa[1*] *& Diriba Abdeta Bushara*[1]

[1] Ethiopian Forestry Development, P. O. Box 24536, Code 1000, Addis Ababa, Ethiopia.
[*] Author for Correspondence ORCID: https://orcid.org/0000-0002-8084-3096; email: aadugna2008@gmail.com.

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ABSTRACT

Forests provides non-timber forest products (NTFPs), which support the livelihoods of hundreds of millions of people worldwide. Studies on the contribution of NTFPs to local people's livelihood improvement and poverty alleviation have grown in popularity. However, information on the contribution of NTFPs to annual household income is limited. The purpose of this study is to assess the role of NTFPs in local peoples' livelihoods. The study employed a multistage sampling technique. A structured questionnaire was used to collect information during a face-to-face interview. Furthermore, key informant interviews and focus group discussions were used to collect data on major NTFPs and triangulate data from HHs surveyed. An interview was conducted with 181 households in and around the forest at random. The most important NTFPs extracted from the forest were forest coffee, honey, charcoal, Aframomum kororima, fuel wood, lianas, Rhamnus prinoides, and medicinal plants. According to the findings, after crop production, NTFPs were the second most important source of income, accounting for 28% of total household income on average. Household NTFP contributions vary by wealth category, with poor (46%) and medium (40%) households contributing more than rich (14%). In general, income from various NTFPs contributes significantly to the annual income of local households, providing an important incentive to conserve forest resources in a sustainable manner. Better policies and strategies are required to sustain local people's livelihoods while conserving forest resources.

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INTRODUCTION

Forests provide a variety of products that are important to the livelihoods of local people, which are classified as timber and non-timber products (Suleiman *et al.*, 2017). Different researchers define NTFPs differently. NTFPs are defined as "any natural resource collected from the wild by rural people for direct consumption/income generation on a small scale," according to Meles *et al*. (2016)**.** Wild edible plants, medicinal plants, floral greenery, plant fiber, fungi, resins, fuel wood, and small diameter wood for poles and carvings are among them. Because NTFPs have multiple definitions, finding a single definition in the current literature is difficult. Individuals and organizations have revised the definition in a variety of ways to meet their specific requirements (Ahenkan & Boon, 2011). In this study, NTFPs are natural forest system components that are not typically cultivated. They are plants or plant parts with monetary or consumer value.

Local people in rural areas rely on forests for non-timber forest products (NTFPs) for subsistence and income generation. NTFPs are an important source of income for local people living in and near forests, as they provide food, medicine, employment, and help to alleviate poverty (Endamana *et al*., 2016). Households, for example, receive supplemental seasonal income from the sale of NTFPs, particularly during periods of declining economic activity such as drought and low agricultural output (Malleson *et al*., 2014). NTFPs are a vital source of income for millions of people, and obtaining them from natural forests is a difficult task. Many people, particularly those living in rural areas, collect and sell these items on a daily basis in order to make a living (Agbogidi, 2010). Millions of people around the world use biological products derived from NTFPs extensively, and it is estimated that approximately 1.6 billion people worldwide rely on NTFPs for livelihood sustenance (Bwalya, 2013). In Africa, NTFPs continue to be an important source of nutrition, health, and income for households (Shemnga, 2015). Many people who live in or near forest reserves collect a wide range of commercially valuable forest products, including fruits, gums and resins, medicinal and aromatic plants, and bamboo. These products are critical to the livelihoods of rural communities and, in some cases, account for a significant portion of household income (Tambi & Kengah, 2018).

NTFPs are an important component of food security and a source of income for the poor in many developing countries. According to Demie (2018), more than 80% of local communities in developing countries use NTFPs to meet some of their health and nutritional needs. Ethiopia is another

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developing country with a diverse plant variety that provides numerous NTFPs. Coffee, spices and condiments, honey and wax, bamboo, edible plant products such as leaves and shoots, fruits, seeds, mushrooms, fodder, fibres, bark, essential oils, tannins and dyes, resins, latex, ornamental plants, giant/long grasses, natural gums such as gum Arabic, frankincense, and myrrh are among the most important NTFPs in Ethiopia (Solomon, 2016). NTFPs are an important part of food security. In Ethiopia, NTFPs cover a wide range of goods, and the majority of them are heavily used to supplement household income and diet, particularly during the harshest seasons of the year. Worku (2014) estimates that NTFPs contribute up to USD 2.3 billion to Ethiopia's national economies each year. NTFPs are used by the majority of local households for a variety of purposes, including food, medicine, and income generation.

As a result, sustainable NTFP utilization is viewed as an effective management strategy that allows local people to meet and sustain their livelihoods while also contributing to forest conservation. However, there was a gap in documenting existing NTFPs and management practices, and little attention was paid to sustainable and viable NTFP management in Ethiopia's mosaic landscape in general, and in the study area in particular. There is still a lack of awareness and understanding about the sustainable management of NTFPs in the livelihoods of local communities (Mukul *et al*., 2010). As a result, the study's goal is to provide useful information on the major NTFPs and their income contributions to local communities.

MATERIALS AND METHODS

The Study Area

The study was conducted in Belete Forest, Shabe Sombo Woreda, Jimma Zone, Oromia National Regional State (Figure1). It is located 375 kilometres southwest of Addis Ababa in the Belete Gera Forest. The elevation in the area ranges from 1300 to 3000 meters above sea level, and it is situated between 7°30' and 7°45' N latitudes and 36°15' and 36°45' E longitudes(Kitessa & Tsegaye, 2008).

The soils in Belete Forest are typically fine-textured. Leptosols can be found on mountain peaks, steep slopes, and stream banks where the soil is shallow (less than 30 cm deep). Nitisols and Cambisols are found in areas with moderate slopes and forest cover and are more than 100 cm deep. Luvisols are the most prevalent in depressions (marshes and lowlands along rivers). The region receives the most annual rainfall between June and September, averaging between 1800 and 2300 mm. The average yearly temperature in the region ranges from 15 to 22 degrees Celsius.

According to a survey, 45.3% of the land in this Woreda is arable or cultivable, 44.9% for annual crops, 6.1% for pasture, 25.8% for forest, and the remaining 22.8% is swampy, degraded, or otherwise unusable. This forest is a remnant of the dry, evergreen Afromontane Forest that can still be found in southwest Ethiopia. It has been under participatory forest management since 2003 for successful management, and it is currently under the concession of the Oromia Forest and Wildlife Enterprise. According to, the forest covers an area of approximately 25,597.94 ha (Kitessa &

Tsegaye, 2008). Syzygium guineense, Olea welwitschii, Pouteria adolfriederici, and Prunus Africana are the dominant trees in this forest. Some of the most common trees in this forest are Syzygium guineense, Olea welwitschii, Pouteria adolfriederici, and Prunus Africana. Non-timber forest products (NTFPs) from the forest include wild gesho, bamboo, lianas, spice, fire wood, and feed. This forest has a high biodiversity, making it critical for biodiversity conservation and local livelihoods (Schmitt *et al*., 2010).

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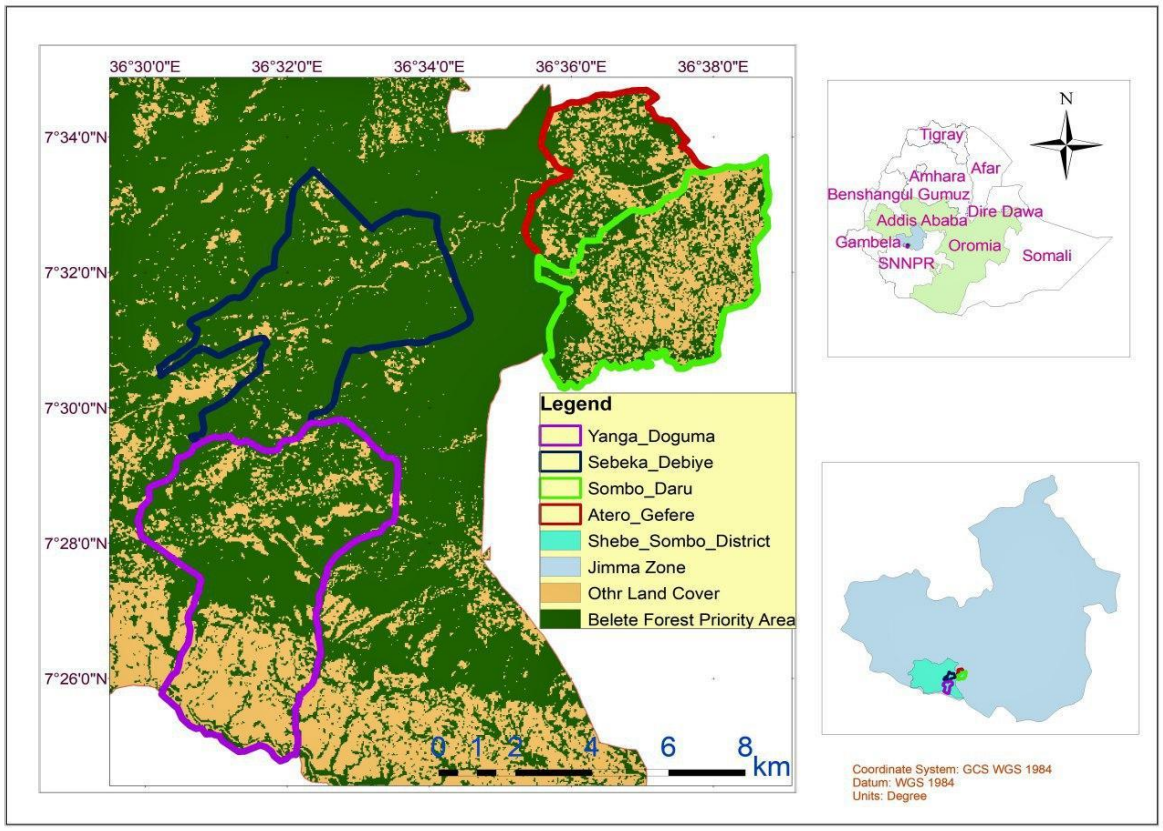
Figure 1: Map of the study area



Source: Authors' sketch (2020) using Ethiopia map shape file 2013.

Sampling Technique and Sample Size Determination

A multi-stage sampling method was used to select the study's sample households. First, Kebeles in the study area were purposefully chosen, and then four Kebeles in the study area were chosen based on their proximity to the forest. Finally, household heads from the Participatory Forest Management (PFM) members in the study area were sampled. The total number of households chosen from the four Kebeles study area was 1991. (Table 1). As a result, 181 sample sizes were calculated using Yemane (1967) formula and the probability proportional to sampling size technique (Equation 1).

$$n=\frac{N}{1+N(e)^2}$$

Equation (1)

Where: n = sample size, N = size of targeted total population, e = the precision level.

As a result, a representative sample size of 95% confidence and 7% precision was used due to budget and time constraints. The heads of the sampled households were chosen at random using a lottery system based on random draws. Each member of a randomly chosen Kebeles' household was assigned a unique number, and the households were drawn at random without being examined.

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Table 1: Households and households sample size

No	Kebeles' Name	Total HHs	PFM member HHs size	Sampled HHs size
1	Atero Gefare	560	540	49
2	Sebeka Debiye	694	594	54
3	Sombo Daru	467	358	33
4	Yanga Doguma	509	499	45
Total		2230	1991	181

Methods of Data Collection

The data was collected by the researcher with the help of trained enumerators from February to April 2020. Individual household heads provided primary data, while secondary data were obtained from other sources. During the household survey, the household heads were the key respondents because they are responsible for the house and are more knowledgeable about NTFPs. However, in the absence of the family's head, the wife was interviewed (Suleiman *et al*,. 2017). Face-to-face interviews, Key Informant Interviews (KII), and Focus Group Discussions (FGD)

were conducted using structured questionnaires. Eight KIs (two from each Kebele) were chosen to identify major NTFPs available in the study area. Four focus group discussions were chosen, with a total of 20 participants (five in each Kebele) to gather information on the major NTFPs available, collected, and sold in the study area. Secondary data were also obtained through document review, which involved reviewing various study-related documents such as journal articles, books, and government reports. The sample HHs living in the selected Kebeles were classified as poor, medium, and rich (Table 2). The study's wealth ranking

sought to determine which wealth category

was most reliant on NTFPs.

Table 2: Wealth ranking in Shabe Sombo Woreda

Criteria of wealth ranking category		Wealth category		
		Poor	Medium	Rich
Landholding size		Less than 1 ha	1-2 ha	More than 2.5 ha
livestock possessions	Ox	≤1	2	More than 2
	Cow	<2	2-5	More than 5
	Sheep	<2	2-4	More than 4
	Goat	≤2	3	More than 3

Source: Shabe Sombo District Agriculture and Rural Development Office (2014)

Methods of Data Analysis

The Statistical Package for Social Sciences (IBM SPSS) version 20 was used to analyse the data. To analyse and summarize data on major types of NTFPs and household incomes from various sources, descriptive statistics such as percentage and mean were used. The ANOVA test was used to determine the level of significance of different income sources in relation to respondents' wealth status. The contribution of NTFPs income to local people's livelihood was calculated using the relative NTFPs-based income to total household income. The relative NTFPs income (RNTFPI) of households was calculated as the percentage of total income derived from NTFPs utilization to total household income (Vedeld *et al*., 2007). Because it is difficult to determine what level of absolute

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income determines NTFP contributions to households, NTFP contributions are based on relative non-timber forest products income rather than absolute NTFP income.

$$\text{RNTFPsI} = \frac{\text{TNTFPsI}}{\text{THI}} * 100$$

Equation (2)

Where: RNTFPFI = Relative NTFPs income; TNTFPI = Total NTFPs income; THI = Total household income.

RESULTS AND DISCUSSION

Characteristics of Respondent Households in the Study Area

The majority (84.5%) of sample household heads in the study area were male, with only 15.5% being female. The study area's respondents ranged in age from 25 to 80 years old, with a mean age of 47. An estimated 57% of those polled were illiterate, with the rest attending primary (27%) and secondary (11%) schools. Furthermore, 90% of the household heads were farmers, with 1.2 hectares of land on average.

Table 3: Characteristics of households in the study area

Variables		N	Min	Max	Mean	Std. Dev.
Age (year)		181	25.0	80.0	47.45	12.88
Sex	Male	153 (84.5%)				
	Female	28 (15.5%)				
Marital status	Married	175 (96.7%)				
	Divorced	3 (1.7%)				
	Widowed	3 (1.7%)				
Family size		181	1	11	5.05	2.388
Occupation	Farmers	164 (90.6%)				
	Daily labour	2 (1.1%)				
	Petty trader	10 (5.5%)				
	Government employee	5 (2.8%)				
Education	Illiterate	103 (56.9%)				
	Primary education	49 (27.1%)				
	Secondary education	19 (10.5%)				
	College	8 (4.4%)				
	University	2 (1.1%)				
Landholding size (in hectare)		181	0.00	3.50	1.244	0.9346
Wealth status	Poor	70 (39%)				
	Moderate	85 (47%)				
	Rich	26 (14%)				
NTFP collectors	Male	53 (29.3%)				
	Female	128 (70.7%)				

Major NTFPs Available in Belete Natural Forest

According to the findings of the study, the majority of interviewed households in the Belete natural forest collect a variety of NTFPs for daily subsistence and income generation. According to the respondents, the major NTFPs collected from the forest in the study area were wild coffee, fuel

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woods, lianas, wild honey, and charcoal, but limited medicinal plants, wild gesho, and kororima. According to Heubach *et al*. (2011), all interviewed households were involved in the collection of NTFPs.

The presence of NTFPs in Belete natural forest contributes significantly to the well-being of the forest's local inhabitants. The findings revealed that 28.2% of respondents were involved in the collection of wild coffee from the forest (Figure 2). Ethiopian honey production is increased by hanging traditional beehives in the forests. The study found that 37% of respondents collect honey from the forest. This implies that honey collection from the forest was low because honey collection is

a difficult activity in which only a small number of people participate, as revealed by focus group discussions. This study's findings are more significant than those of Olugbire *et al*. (2015), who concluded that honey production was practiced by a small proportion of the rural population 0.1% of the total.

In the study area 37.6% of respondents in the study area were found to be gathering medicinal plants from the forest. As indicated by respondents, medicinal plants collected from the forest were used to treat people and animals who became ill. Moreover, during discussions, respondents reported that medicinal plants collected from the forest treat diseases such as coughing, toothache, backbone and abdominal pains, stroke, wound healing, and hernia. Medicinal plants harvested from the forest are used to treat a variety of illnesses, according to Demie *et al*. (2018). This is consistent with the fact that medicinal plants from forests account for a significant portion of the medicine value that can benefit nearby communities.

This study found that 15.5% of respondents were involved in the collection of shiny-leaf Buckthorn from the forest. This implies that the majority of people in the study area were not involved in Rhamnus prinoides collection because it was mostly used to make local beer during festivals. Rhamnus prinoides was collected primarily for income generation, but during a group discussion it was revealed that it is also used in the production of a local beverage known as 'Tella.' According to information and observations from respondents in the study area, Rhamnus prinoides was collected all year, but production increases dramatically during the dry season The main type of spice produced in Ethiopia is kororima (Aframomum kororima), and the study area findings show that 16% of respondents collect spices from the surrounding natural forest (Figure 2).

This means that participants in the study gather spices based on their availability and convenience. This study found that 90.6% of respondents were involved in the collection of fuel wood from the forest. According to Msalilwa (2013), 98% of local communities rely on firewood as their primary source of energy. It was revealed that, 24.3% of respondents in the study area were involved in charcoal production, which contributed to their annual income. This could be because charcoal is cheap and easy to transport, distribute, and store. According to Ibrahim *et al.* (2016) urban communities use charcoal on a daily basis.

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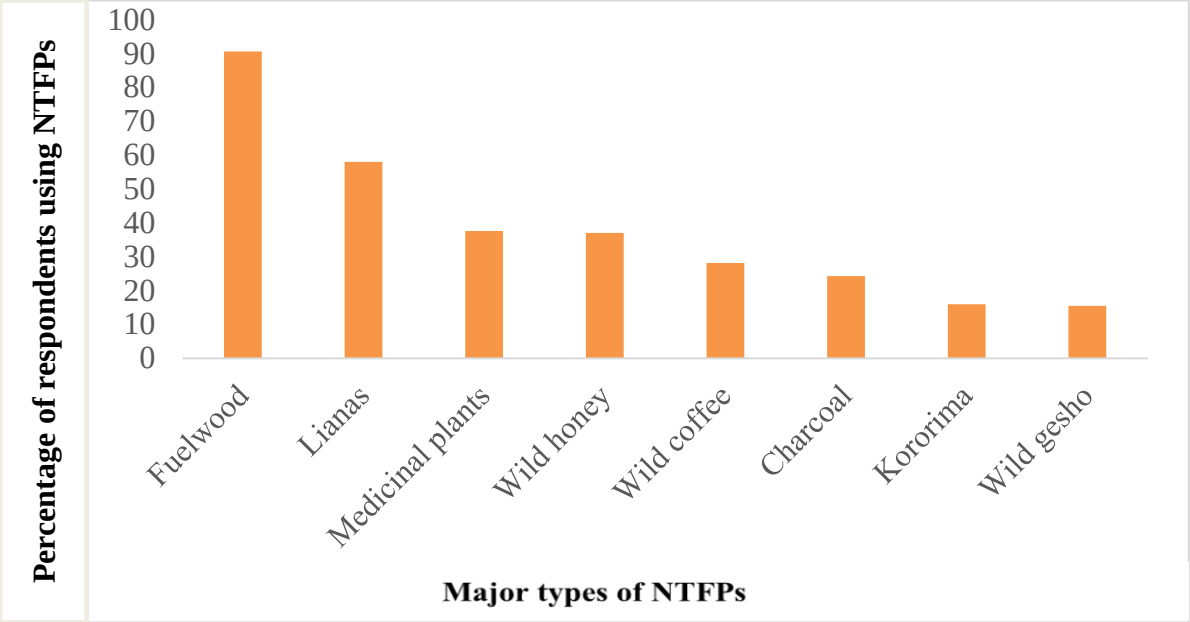
Figure 2: Proportion (%) of respondents using different NTFPs



Main Income Sources of Households by Livelihood Activities

The primary livelihood strategies of local communities in the study area were agriculture (crop production and livestock husbandry), NTFP collection, and off-farm activities. Households in the study area combined crop farming, forest activities, and livestock farming, but there were also non-livestock households. The majority of sampled households were engaged in agricultural activities such as teff, coffee, maize, barley, khat, enset, and wheat production because farming is a common activity in many rural communities. According to the study, farm income is the highest, accounting for 57% of total annual household income, followed by NTFPs (28%). (Table 4). Off-farm activities and livestock husbandry contributed the least to average annual household income, accounting for 12% and 3%, respectively, of total household income (Table 4). Farming, NTFP, and livestock income differ significantly ($p<0.05$) between poor, medium, and wealthy households. Poor households relied on NTFP collection and off-farm activities more than middle and upper-income households (Table 4). Rich households, on the other hand, were more involved in farming and livestock production than poor and middle-class households. Off-farm activities accounted for approximately 1061.54 ETB (Ethiopian birr) of the average annual income of rich households. While poor households' average annual income from off-farm activities was 2328.57 ETB, it was more than double that of rich households. This is because rich, poor, and middle-income households combine wage employment and petty trading with farming and forest activities to meet subsistence needs. The standard deviation for NTFPs income indicates that NTFPs income differed between households due to

differences in resource use and socioeconomic

characteristics.

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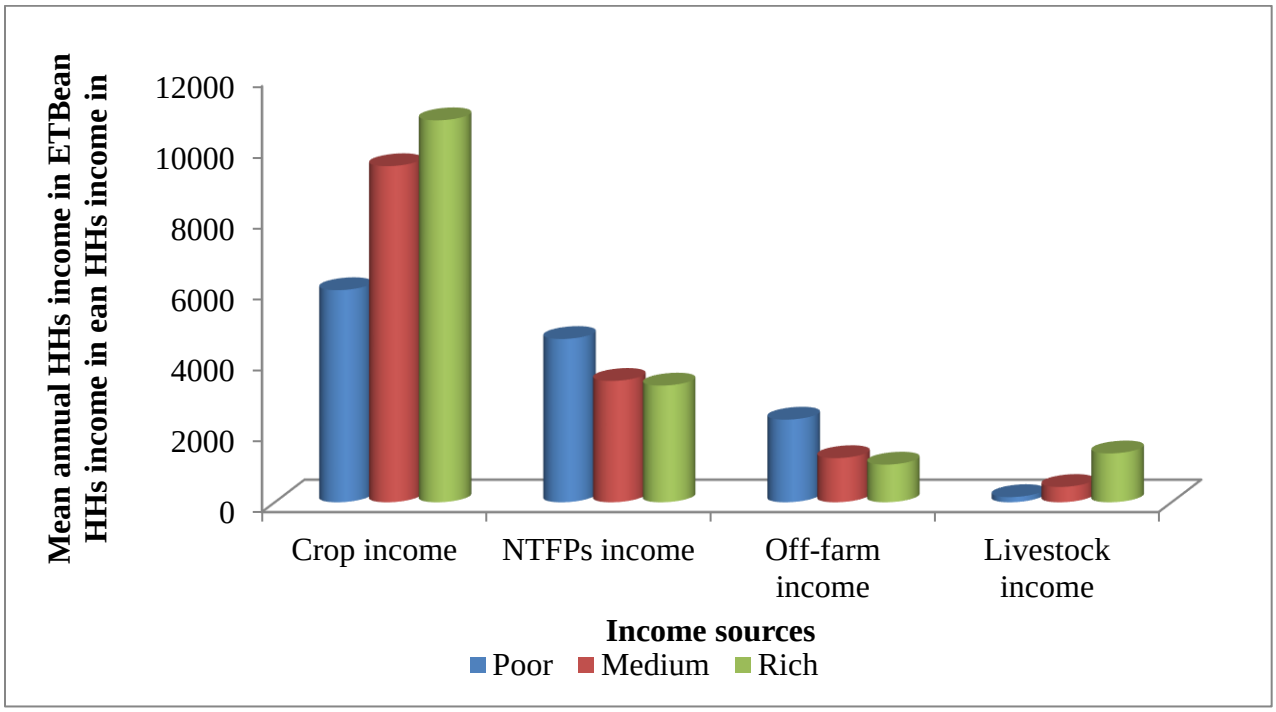
Table 4 : Mean annual income to households

Sources of HHs income	Poor		Medium		Rich			
	Mean	SD	Mean	SD	Mean	SD	Share %	P-value
Farm income	5,976.54	3,924.55	9,470.47	4,786.15	10,763.08	5,072.03	57	0.00
NTFPs income	4,601.23	2,127.58	3,420.06	2,637.37	3,288.08	3,548.46	28	0.031
Off-farm income	2,328.57	5,379.70	1,244.12	3,737.05	1,061.54	2,459.77	12	0.23
Livestock income	146.07	311.19	432.18	681.91	1,376.92	1,749.98	3	0.00

SD= Standard deviation of mean, Significant at 5% significance level.

In this study, however, the low contribution of livestock rearing to total household income demonstrated that livestock husbandry is a low-income generating practice. The average number of livestock possessions in the study area is low, implying that livestock income is restricted. In rural Africa, livestock and human capital are the assets that distinguish the well-off from the poor (Niehof, 2004). Rich households were more involved in farming and livestock production than poor households, while poor households were more involved in NTFPs and off-farm activities (Figure 3).

Figure 3: Proportion of household income among wealth categories



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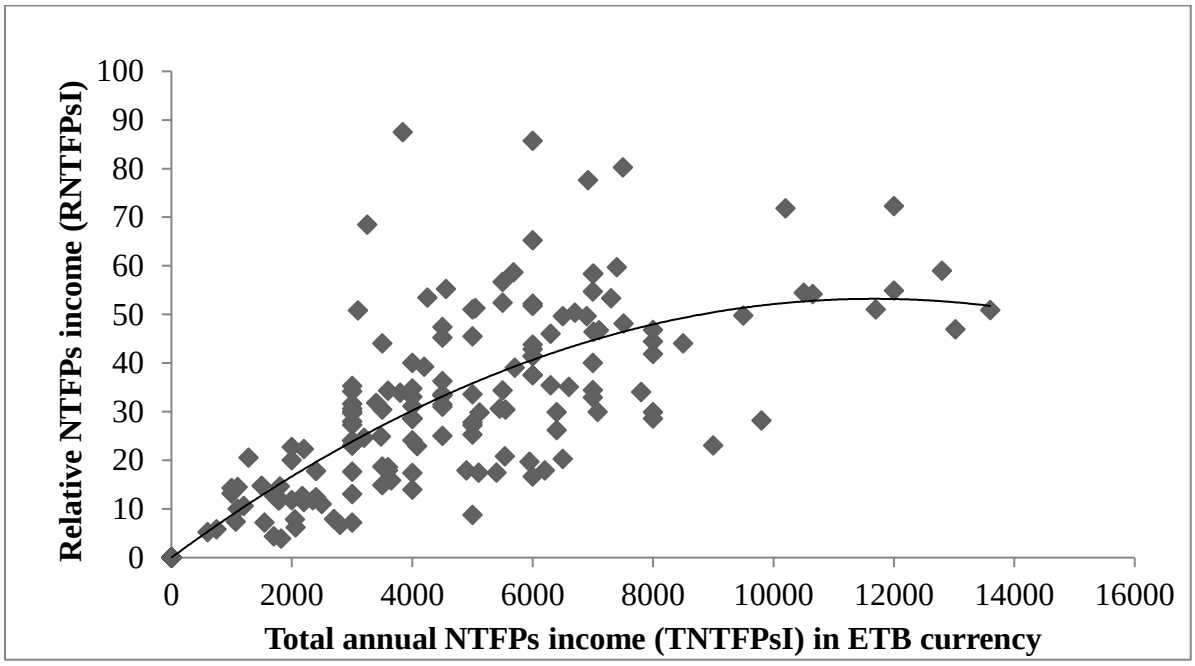
Absolute and Relative NTFPs Income

The contribution of NTFP to total household income was calculated using the relative NTFP incomes. The survey's unexpected finding was that the contribution of NTFPs income varies more depending on income group. The contribution of NTFPs income to total household income was greater in households with a high total NTFPs income. This study discovered that relative NTFP income varied systematically with income level. As NTFPs income increased, so did relative NTFPs income; thus, poor households relied on NTFPs income more than rich households. This is because NTFP income is the primary source of income for Belete Forest households.

Figure 4: The relationship between absolute and relative NTFPs income



NTFPs Income by Wealth Category

The contribution of NTFPs varied according to wealth category. There is a significant difference in NTFP income between poor, middle, and wealthy households ($p<0.05$) (Table 5). The poor contributed 46% of NTFP income, while the medium and rich contributed 40% and 14%, respectively. The average NTFP income of poor households (4,601.23 ETB) was higher than the average NTFP income of rich households (3,288.08). According to Sjaastad *et al*. (2005), the poorest quintile has higher NTFP income than the wealthiest quintile. The contribution of NTFP income was significant for poor households (those lacking at least one of the two resources: land and livestock). This demonstrates that NTFPs income contributes significantly to the poor group of the local community's annual total income.

As a result, NTFPs income can be considered the mainstay of poor households. This demonstrates that NTFP income plays different roles in the livelihoods of different types of local community members in the study area. This means that poor people are relying on NTFPs for survival. However, the income from NTFP is used as a supplement by the wealthier groups, whereas it is essential for the middle and poor households. Income from NTFPs can sometimes provide a way for the poor to invest for the future. According to some informants, if the poor work hard in NTFP-related activities for a

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year, particularly traditional beekeeping and forest coffee collection, they can buy an ox or livestock. The poor are assumed to be more reliant on forest resources (Timko *et al.*, 2010). As a result, the relative annual income contribution of NTFP contributed more to poor and medium-income households than to rich households. At the 5% significance level, ANOVA tests support the existence of a significant difference in the relative contribution of NTFPs income among poor, medium, and rich households.

Furthermore, increased consumption and income from NTFPs provide incentives for local communities to conserve forests in a sustainable manner. According to Debela et al. (2019), income from NTFPs serves as an incentive for rural people to actively participate in and undertake proper forest management. This implies that people in the study area were conserving forest in order to meet their long-term NTFP income and daily consumption needs. This is because local communities' livelihoods are likely to persist as long as resources are extracted in a sustainable manner. This is consistent with the findings of Jones *et al*. (2004), who discovered that NTFPs were among the best strategies for increasing forest income while addressing conservation goals. The study area's local communities collect NTFPs without significantly altering the forest, preserving forest environmental services and biological diversity. This is due to the fact that the most commonly used plant parts were dead stems, branches, and leaves. Collecting these products, particularly dead branches, has little ecological impact and, as a result, has little effect on species at the individual and population levels. Collecting NTFPs from the wild can help with long-term utilization of the species in a variety of ways, depending on the plant part extracted. According to Ros-Tonen *et al*. (2005), NTFPs are important in preserving the value of ecosystem services because extraction has no negative impact on the forest or trees.

Table 5: non-timber forest products income

Wealth categories	Mean NTFPs income (ETB)	RNTFPsI %	P-value
Poor	4,601.23	46	0.031
Medium	3,420.06	40	
Rich	3,288.08	14	

Availability of major NTFPs per each Kebeles

Despite the fact that NTFPs are accessible in all Kebeles, the collection of each product differs due to the purpose of collection and distribution. During focus group discussions, it was stated that the most common plant parts used for firewood and charcoal were branches, followed by deadwood and stems. According to focus group discussions, plant parts used for medicinal purposes included leaves, roots, barks, and seeds. The study also revealed that the collection of NTFPs from the forest, such as medicinal plants, kororima, and wild gesho, was low in comparison to fuel wood and charcoal, due to the purpose for which they are consumed or used and their availability in the area (Table 6). The majority of NTFPs found in the forest were found to be fuel wood, which is used as the primary cooking fuel. According to the informants, most households in the Belete Forest area do not have access to electricity from Shabe town and continue to cook on traditional three-stone stoves. As a result, firewood is the most common choice among local communities in the study area. These open fire stoves typically consume a significant amount of cooking biomass fuel, necessitating frequent forays into the forest in search of firewood. Chou (2017) reports that 98% of respondents collect fuel wood as a source of energy.

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Wild honey, wild coffee, black cardamom, shiny-leaf buckthorn, medicinal plants, fuel wood, charcoal, and lianas were the most commonly collected NTFPs, accounting for 28% of total annual household income in the study area. The majority of the NTFPs collected from the forest were fuel wood, which was used as a primary energy source and a significant source of cooking fuel. Wild gesho and kororima, on the other hand, were collected to a lesser extent in the study area. Households in the study area gathered NTFPs for subsistence and income generation. The majority of the NTFPs collected from the forest were fuel wood, which was used as a primary energy source and a significant source of cooking fuel. Wild gesho and kororima, on the other hand, were collected to a lesser extent in the study area. Households in the study area gathered NTFPs for subsistence and income generation. Because of their low market value, the majority of NTFPs in the study area were sold unprocessed in local markets. The highest NTFP income is generated by fuel wood and wild honey, while the lowest is generated by wild gesho and medicinal plants. The value of forest income varied greatly across wealth classes. NTFPs increase the annual income of poor households. The value of forest income varied greatly across wealth classes. NTFPs contribute more annual income than the medium and wealthy categories because they are the mainstay of poor households. This means that households with varying socioeconomic and demographic characteristics rely on NTFPs in various ways due to varying consumption motives and responses to varying challenges. Understanding forest resource use in terms of NTFPs aids in the design of forest resource conservation by improving local communities' livelihoods. As a result, increased NTFP consumption and income stimulate local communities to conserve their forests in a sustainable manner. It is suggested that income derived from NTFP collection contributes significantly to the annual income of households in the study area. As a result, policies and strategies aimed at improving the well-being of local communities and conserving forest resources should prioritize increasing the contribution of NTFPs.

Table 6: Percentages of different NTFPs collected by households

NTFP types	Percentage of respondents using NTFPs per Kebeles			
	Atero Gefare	**Sombo Daru**	**Sebeka Debiye**	**Yanga Doguma**
Wild coffee	12	42	4	47
Wild honey	37	39	43	29
Lianas	24	33	20	73
Medicinal Plants	31	42	39	40
Wild *Gesho*	4	9	0	51
Kororima	14	30	7	16
Fuel wood	88	85	94	87
Charcoal	35	6	28	24

Contribution of NTFPs to HHsI and Its Implication in Forest Conservation

Non-timber forest products are the study area's most important source of household income, accounting for 28% of total household income. Fuel wood contributes the most to total NTFP income (34%), followed by wild honey (28%). Charcoal, forest coffee, lianas, and medicinal plants contributed 13%, 10%, 7%, and 2% of annual NTFP income, respectively. Rhamnus prinoides and Aframomum kororima cover the remaining 3% of each NTFP's income share (Figure 5). This finding is consistent with the findings of Aiyeloja *et al.* (2012), who discovered that a significant proportion of local

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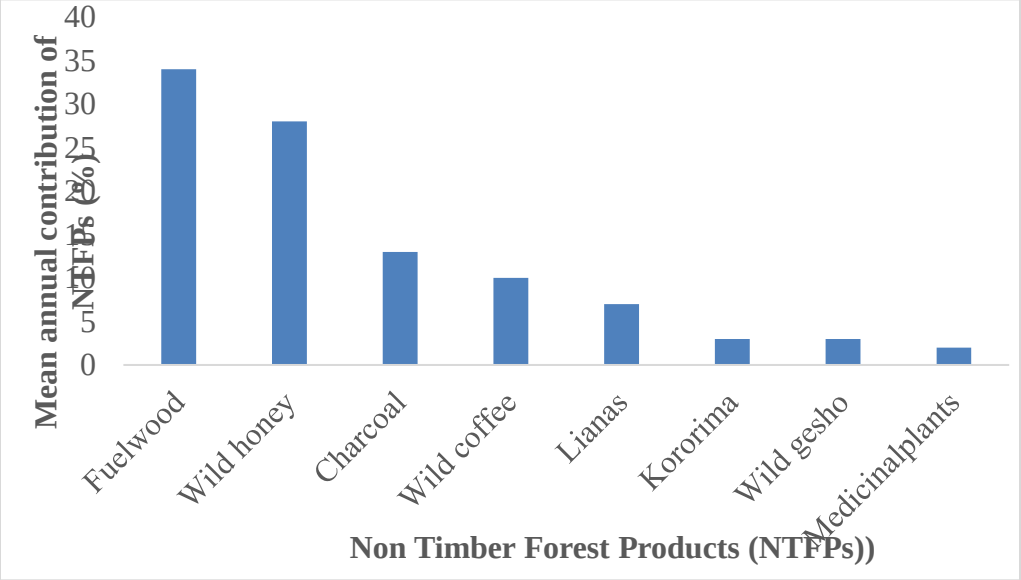
people make a living by collecting, extracting, and selling NFTPs from the forest.

NTFPs play an important role in the livelihoods of local communities in the study area by providing income and life support sustenance.

In this study, NTFPs also accounted for the second largest share of total household annual income. According to this discovery, NTFPs significantly contribute to household income and can thus serve as a safety net during times of adversity and other emergencies. The findings show that households' annual NTFP income (28%) is higher than in Reshad *et al*. (2017) and Debela *et al*. (2019), where the share of NTFP income was 10.11% and 23%, respectively. However, when compared to Melaku *et al*. (2014), where NTFP income is the second most important source of household income, accounting for approximately 47% of total household income, the annual income of households from NTFPs (28%) in this study is low. This could be explained by the methods and approaches used, as well as price fluctuations. This finding is also consistent with the findings of Suleiman *et al*. (2017) that NTFPs contribute 30% of total annual household income.

Figure 5: Mean annual contribution of NTFPs to household income



CONCLUSIONS AND RECOMMENDATIONS

Forests provide a variety of NTFPs that benefit the livelihoods of local communities. According to the findings, the majority of residents in the study area collect a variety of NTFPs for consumption and income generation. Wild coffee, fuel woods, lianas, wild honey, and charcoal were the most commonly consumed NTFPs, but medicinal plants, wild gesho, and kororima were rare. Income from NTFPs is crucial in contributing to the livelihoods of local households. NTFP income accounts for 46%, 40%, and 14% of income in rich, medium, and poor households, respectively. The finding implies that there is a difference in the level of dependency between wealth categories, as poor households have a higher share of NTFP income. For example, the contribution of NTFPs to households lacking land and/or livestock accounted for approximately 28% of their total income.

Understanding the benefits of forest resources in terms of non-timber forest products (NTFPs) may aid in the design and implementation of forest conservation programs. Hence, increased

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consumption and income from NTFPs create incentives for local communities interested in long-term forest conservation. The findings show that NTFP collection on small scale contributes significantly to the annual income of households in the study area. As a result, policies and strategies aimed at improving local community well-being and conserving forest resources should prioritize increasing NTFP contributions.

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