

Assessments of non-timber forest products status in the Guraferda district of Ethiopia.

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Abstract: Forests and other vegetation resources in Guraferda district offer diverse NTFPs that provide substantial inputs for the livelihoods of the community. Thus, information regarding to the status of NTFPs of the district is vital for proper management of these resources. However, up to date information on the status of non-timber forest products in Guraferda district is found to be lacking. Therefore, this study was conducted to assess the status of NTFPs in the district. Information was collected through household survey and key informant interview. Analysis of data was accomplished through the use of SPSS (version 20) and Microsoft Excel software. Results of the study identified that important NTFPs of the district like honey, forest coffee, forest tuber, forest spices, important health care medicinal plants, *Antiaris toxicaria* tree with a bark that serves as cloth and sleeping mat preparation, edible forest leaves and fruits, and wild animals for bush meat consumption, that have significantly declined.

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Key words: NTFPs, Forest coffee, Guraferda

Introduction

Background

Around the world, it is estimated that the total value of world trade in non-timber forest products (NTFP) is approximately 1,100 million USD (Tejaswi, 2008). In developing world 80% of the population use NTFP (Non-Wood Forest Product) to meet some of their health and nutritional needs (FAO, 1998). FAO (2002) approximated that more than half of the developing world relies on NTFPs for nutritional and health needs.

Ethiopia's forest and other vegetation resources offer diverse NTFPs that provide substantial inputs for the livelihoods of a very large number of people in the country and an estimated annual turnover more than USD 2.3 billion to the national economy (Mohammed, 2014). The country has substantial areas suitable for the cultivation of NTFPs. The contribution of NTFPs to rural livelihoods, the national economy and ecosystem stability is significant. In rural Ethiopia, a majority of the households make use of NTFPs for different purposes, ranging from food, feed, energy, and medicine to income generation and cultural practices (Zenebe *et al.*, 2013). Eventhough such importance, changes in climatic conditions and land use in this century (Sala *et al.* 2000) adversely affect provision of ecosystem services (MA, 2005) such as NTFPs.

The local community in southwestern Ethiopia has very high dependency on several species of plants in the forest. Some of NTFPs such as Wild coffee, honey and bees' wax and ecotourism occupy key positions in the state's economy, particularly in foreign currency earning through export (Demel *et al.*,

2010). Most of the plant species recorded in all areas have one or more types of local uses. Major non-timber forest products (NTFPs) used in the region includes; food, fodder, local construction materials, medicine, spices, honey, farm implements, household furniture and fuel wood. In the region Honey is the major NTFP for income generation (Tadesse and Masresha, 2005). Medicinal plants in Sheko and Yaju districts are mostly collected and prepared by traditional health practitioner and they offer a gross annual income of USD 1382.40 for each traditional health practitioner, and total net income of USD 3.00 and USD 1.80 per ha for Sheko and Yaju, respectively (Rojahn, 2006). The native people in Guraferda district are Sheko, Me'enit and Mejengir who are highly dependent on forest resources especially NTFPs (Mohammed, 2014). Therefore, this study aims to assess the status of NTFPs in the district.

Materials And Methods

Description of the study site

Guraferda district is found in Bench Maji Zone of Ethiopia at about 630 km southwest of Addis Ababa. The Geographic location of the site is 34°56' to 35°26'13" E (Latitude) and 6°29' to 7°13' N (Longitude). The district is bordered on the northeast by Sheko, on the east by South Bench, on the south by Bero district, on the west and north by the Gambela Region, and on the southeast by Menit Shasha.

The area is characterized by variable topography. A number of hills and mountains characterize the landform. The major reference soil group in Guraferda is fertile nitosols (Debonne, 2015). Agro-climatically, the area is characterized mostly by low land (Moist

Qolla) and medium (Woynadega) (Abeje, 2011). The mean annual rainfall of the district is about 1332mm whereas the mean annual minimum and maximum temperature of the area ranges between 20°C and 29°C, respectively (Abeje, 2011).

The area is also characterized by *Combretum* spp., *Oxytenanthera abyssinica* (A.Rich.) Munro, *Boswellia papyrifera*, *Lannea schimperi*, *Anogeisus leiocarpus*, and *Stereospermum kunthianumcham*, where the under-storey vegetation is constituted of a combination of herbs and grasses (Sebsebe *et al.*, 1996).

Data Collection procedure

Data were collected through Household Survey and key informant interview. About 52 respondents were purposively selected from two peasant associations (Otuwa and Malagonac) for interview. These PAs were selected purposively due to native communities had occupied dominantly. Respondents whose ages greater than 35 years were purposively selected for responding the structured and semi structured questionnaires. Respondents of 35 years and above were selected for the reason that they can compare the status of NTFPs access at present and before 15 years (before resettlement and agricultural investment expansion).

Data Analysis

The statistical data were coded, rearranged, summarized, and entered for analyses using SPSS and Microsoft excel. Descriptive statistics like; percentage and frequencies were analyzed and presented in the form of tables and graphs.

Result And Discussion

Historical Use of NTFP

Non timber Forest Products (NTFP) have been collected by native communities for countless generations in Guraferda district. For this research, the historical perspective dates to a period of living memory of the elder members of the village to now. Older members of the communities were asked as key informant about their historical use of NTFP.

Historically native people of the study area were deriving their food sources solely from the forest by collecting a number of products for personal use. Based on household survey results, together with key informant interviews a range of NTFPs were identified as being used traditionally by native members and also its trend.

Types of NTFPs in Guraferda district

Native communities in Guraferda district had used NTFP substantially for household consumption. As respondents and key informants reported, Very important NTFPs in the district that native communities were using before massive natural forest and shrub/bush land disturbances includes, forest

coffee, honey, spices, forest edible tubers, forest edible leaves, wild fruits, mushrooms, medicinal plants, quarry wild animals, and some of them had used tree barks for cloths and mat (*Antiaris toxicaria* tree). According to the survey result of this study they had not used majority of those NTFPs currently because they did not access as a result of decline in their availability. Currently farming communities at Guraferda district particularly natives' use honey as a major NTFP compared with other NTFPs.

Honey

A) Honey production in the past

Honey for the native community in Guraferda district was the backbone of household economy for household consumption especially before 15 years ago, that means before resettlement takes place. Before resettlement, honey was the main food for native Me'enit, Sheko's and Mejengir households. Me'enit was sown maize and 'Gode' sorgum (Me'enit word) for only preparing drink with honey (*Borde*) within the forest by using simple local materials. Otherwise they had used honey and forest tuber as a staple food. Almost all of native communities were hanging beehives prepared from *Cordia africana* tree, while minority of them who could not climb trees for beehive hanging were using 'wolqa' (honey obtained from trees with hollow trunks). Those native dwellers of the district made a hole on the tree trunk slightly near to the ground if they could not climb the tree. Honeybee entered and used the hole of a tree as a hive, then after those family uses *wolqa* honey instead of honey that obtained from beehives. The traditional forest tenure systems protect the rights of a person to his *wolqa* so that other people will not touch it. In terms of honey production, each clan had their own forest tenure right, whereas it was possible to collect any other NTFPs in any forest.

The number of beehives and honey product of native's communities were 52 and 2517.17 kg/year in average, respectively, before resettlement and investment expansion (before the previous 15 years) which did not included *wolqa* honey (table 1). This number especially honey product is not perfectly measured rather it was according to the estimation of informants. Native communities were harvesting honey in average four times a year but it depends mainly on the flowering period of trees and forest lianas especially *Cordia africana* (*Wanza*), *Pouteria adolfi-friedericii* (*Kerero*), *Croton macrostachyus* (*Bisana*), *Manilkara butugi* (*Butigi*), *Vernonia amygdalina* (*Girawa*), and *Polyscias fulva* (*Yezinjero wonber*). During flowering period of these tree species, local people start harvesting honey.

B) Honey production at present

Although native communities of Guraferda district were dependent on honey, due to deforestation,

pesticide application by large plantation crop farms, and lifestyle changes of native communities due to influx of large number of resettlers have been affected the sustainable uses of it. The result of number of beehive and honey production at present in average is 11 and 354.6kg/year respectively (table 1).

When, the number of beehives they use to own and honey production they were getting in average before resettlement is compared to the current number of beehive and honey production, it showed a reduction of 41 beehive (78.85%) and 2162.57kg/year (85.9%) which decreased by about six fold in honey production.

In the studied Kebeles, majorities (75.47%) of respondents point out as scarcity of nectar and lack of

beehive hanging forest were a major reason for decline in honey production and number of beehives. About 15.09% of the respondents said pesticides and insecticides that applied in the large scale agricultural investment areas was a major reason for the decline in honey production and bee colonies decrement. The other 9.3% of the respondents reported the reasons for their honey production and beehive number reduction as lack of materials for beehive preparation.

This finding conforms to the report of Tessema (2014) shows that honey productivity has apparently declined due to deforestation and trunk honey or *wolqa* has also disappeared in Yeki-Godera unique forest, south western Ethiopia.

Table 1: Mean comparison of present and past honey products they have gotten and number of beehive they have owned.

number of bee hives before the past 15 years (Mean ±SD)	honey product per year before the past 15 years (Mean ±SD) (kg/yr)	number of bee hives currently (Mean±SD)	honey products per year currently (Mean±SD) (kg/yr)
52±49.75	2517.17±2446.11	11±13.31	354.6±590.25

Forest Coffee

At Guraferda district a hot drink prepared from dried berries and young leaves known as ‘*Chemo*’ (a tea of coffee leaves), and spiced with pepper, ginger, and other medicinal leaves is a favorite drink and used as medicine for many disease and has a great social values by native communities. Socially those native communities had been coming together at one house to drink *Chemo*. They make meetings at the time when *Chemo* was steamed and *Borde* was prepared.

Prior to resettlement, natives were not having garden coffees. The production of honey and the collection of wild forest coffee are important to many native households at Guraferda (Abeje, 2011). They were using forest coffee leaves for *Chemo* preparation. After resettlement has taken place and also agricultural investment expands, wild coffee was replaced by garden coffee. As Key informants said, forest coffees were their important resources. They were basing their livelihoods by feeding on forest tubers and honey while *Chemo* was consumed as a favorite drink that was also obtained from the forest. This has also been reported by Mirutse *et al.*, (2010) who stated that both the normal drinking coffee and *Chemo* are used by

Sheko communities to dilute some traditional plant medicines. Similarly Mohammed (2014) stated about importance of forest coffee in Benchi Maji zone as *Chemo* for drink and social integration value of the community.

Status of forest coffee at present

Due to the deforestation and fragmentation of major natural forests, local people changed to garden coffee forest production system since the access to natural forest coffee comes near to nil. The local native communities also plant garden coffee for cash income and *Chemo* drink.

As table 2 shown, 44.23% of native’s answer the question about trend and access to forest coffee as “we were using forest coffee when the area was covered with forest, but there is neither natural forest nor forest coffee at the moment.” About 55.77% of the local community said the trend in the availability of forest coffee as decreasing. Majority of the respondents whose response was ‘decreased’ said that “although there is forest coffee, one is expected to travel far to get it.” Due to this they are not using forest coffee currently they relying on planting of garden coffee.

Table 2: trends of forest coffee according to native communities

trends of forest coffee								
increased	no change	decreased	there were before resettlement but there is no currently		total			
frequency	%	frequency	%	frequency	%	frequency	%	
0	0	0	29	55.77	23	44.23	52	100

In view of the current status in the area, some projects such as participatory forest management and wild coffee conservation have been trying to keep some reserves of forest coffee to safeguard from extinction around Otuwa Tululuja control hunting forest reservoirs.

Forest Spices

Korerima, Ginger, and long pepper are the major important wild spices that natives at Guraferda district had been getting from the forest. Korerima grows

before major natural forest was disturbed. Native community were using Korerima, Ginger, and long pepper as food flavour, medicine and with drinks. They were using these spices especially for *Chemo* preparation. The medicinal values of Korerima in the local community were also highly pronounced in different forms. Mostly they used as *Chemo* ingredients. In spite of the higher value attached to these spices by the local community, it is difficult to get these resources under a wild state currently.

Table 3: frequency and number of native respondents about trends of forest spices

trends of forest spices									
increased		no change		decreased		there were before 15 years but there is no presently		total	
frequency	%	frequency	%	frequency	%	frequency	%	frequency	%
0	0	0	0	27	51.9	25	48.1	52	100

As shown in table 3 above, about 51.9% of respondents get forest spices. But the access to these resources is in a decreasing trend. As their response to get forest spices like Korerima and Ginger within the forest, it takes more time and needed a long trip to natural forest. On the other hand 48.1% of those native communities were using these forest resources. But they do not have access to these spices in the wild at present. This study is supported by Alemayehu (2010) reported that *Aframomum korarima* (the Ethiopian cardamom) belongs to the family Zingiberaceae, and is endemic to the montane rainforests of the southwest Ethiopia.

Forest edible tubers

Forest tubers especially *Manihot esculenta* species (Amharic: cassava species; Me'enit: kach, atir kach, Chaka kach) and *Rumex abyssinicus* (in Me'enit:

lekut) were major food sources for the naive community next to honey. In Me'enit tribes, particularly *Lekut* had a great role for their household consumption. This result was also confirmed by the study of Hildebrand (2003) who identified about six forest starchy tuber species at Guraferda that native communities were used.

According to the survey result, 77.36% of native community respondents are not using forest tuber due to decline in availability which was their main food before resettlement and investment expansion. On the other hand, 22.64% of native people said that it has being decreasing. Some of the key informants from native communities also said that they travel a long distance and takes too much time while majority of them said there is no harvestable product at present.

Medicinal plants

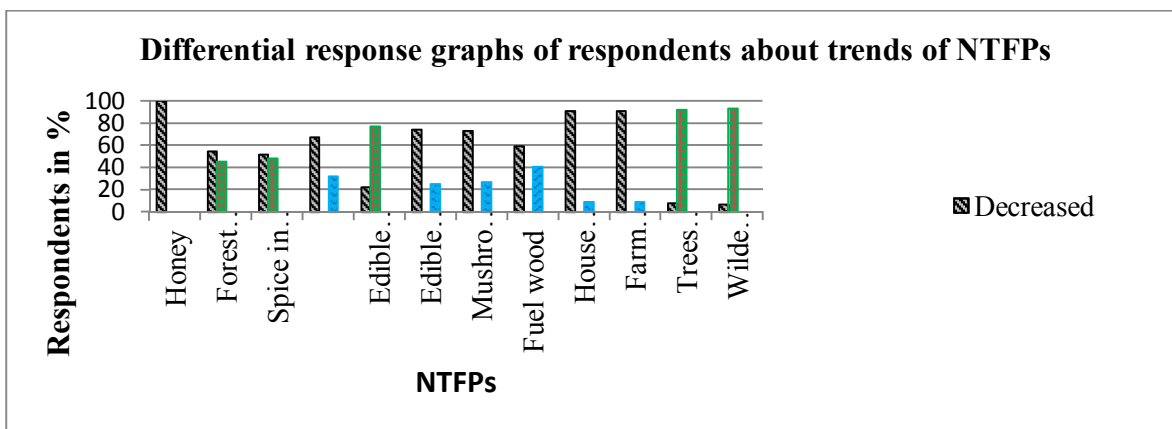


Figure 1: Trends of NTFPs

As key informants said; those native communities had using different plant species as a cure for a plenty of diseases like malaria, headache, stomach costive, for different stomach parasitic disease, and etc. According to those key informants,

majority of medicinal plants are herbal plants and lianas. But there are also many important vascular (woody) plants that have using for medicinal values like *Bersama abyssinica*, *Gardenia ternifolia* and *Vernonia amygdalina*.

Eventhough such importance's, as figure 1 shown, majority of the respondent (67.5%) in the study kebeles reported as medicinal plants have at a decreasing trend. Some of the respondents (32.5%) also reported 'no change' due to they have living around the natural forest and access medicinal plants easily.

Trees with a bark used for cloth and sleeping mat

Antiaris toxicaria (English: Sacking tree, false iroko; Me'etit: Dabit; Dizi: Zem; Sheko & Mejengir: Tengi) is an important tree that native communities especially Sheko's were using the bark for preparing cloth and sleeping mat before resettlement.

Although *Antiaris toxicaria* tree is very important for native communities' in terms of its bark and bee forage value in the study area, it is under devastation as a result of forest disturbances. About 92.2% of native communities said about this tree that there were abundantly before the forest disturbance and we were used its bark for preparing sleeping mat and cloth, but this tree is not found in this area currently. Similarly, 7.8% of them said this tree is at a decreasing trend.

House construction and farm implementing materials

Almost all of the communities use natural forest for house construction materials like lianas for mooring, and trees and shrubs for construction and farm implementing materials. Products for these important necessities are also decreasing. About 90.7% of respondents answer the question about trends in access to these materials as decreasing whereas 9.3% of them said no change. The reason for this decline is obviously forest cover decline.

Edible forest Mushrooms

It is apparent that wild mushroom consumption supplements the nutritional needs of local people. As a result, Native communities at Guraferda district have been using many edible forest mushrooms by collecting from the forest. It is a favourite food for them. According to native respondents in the study area, the access to edible forest mushrooms was in a decreasing trend. About 73.2% of native respondents reported that edible mushroom in the study area has decreased while 26.8% of them said no change in terms of its access. This study agrees with Dawit (2014) studies that reported mushroom consumption is a common practice among many ethnic groups of south and southwest Ethiopia.

Edible forest leaves and fruits

Wild plants in Ethiopia are used as source of food both at times of plenty and of food shortage. According to the survey result, native communities at Guraferda district use many forest leaves and fruits for consumption. Although they use those Wild plants at the district, its accessibility was at a decreasing trend.

According to the survey results, 74.5% of respondents said edible forest leaves and fruits were at a decreasing trend whereas 25.5% of them answered no change. Most of respondents who said no change lives around the forest and get access of these edible leaves and fruits from it.

Wild animals for hunting

Native communities at Guraferda district were practicing wild animal hunting like; Buffalo (*Syncerus caffer*), Elephant (*Loxodonta africana*), Deer (*Cervidae spp.*), and Impala (*Aepyceros melampus*) for their meat consumption. Especially Mejengir and Sheko tribes were highly dependent on these activities. According to survey results of this study, the access to those larger wild animals for hunting was very rare in the period of this research work. About 93.3% of native respondents in the study kebeles said that: "there were important wild animals for hunting before resettlement, but now there are no such animals around our living site". Similarly, 6.7% of them also said these animals have decline both in type and number in relation to conversion of grassland and shrub/bush land to agriculture. This study is supported by (Debonne, 2015 and Abeje, 2011) that reported as Mejengir and Sheko tribes practiced wild animal hunting for meat consumption.

In addition to respondents of the survey and key informants also said, the accesses to those wild animals especially in number were abundant. But now it is not possible to see many of those wild animals like Deer, Buffalo, and Elephant unless they go to Tulujuja control hunting area. Some of them said in the present situation there are some people who can get Impala rarely for hunting. According to respondents, key informants, and group discussion, the main reason for those wild animal situations is directly related to land use/land cover change.

Conclusion

This study found that a significant decrement of important NTFPs that native communities has been used for food sources and utensils like honey, forest coffee, forest tuber, forest spices, important health care medicinal plants, *Antiaristoxicaria* tree's bark that serves as cloth and sleeping mat preparation, edible forest leaves and fruits, and bush meat from wild animals.

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