www.biogenericpublishers.com

Article Type: Review Article

Received: 29/08/2020

Published: 03/09/2020

Open Access Journal of Biogeneric Science and Research
ISSN 2692-1081

DOI: *10.46718/JBGSR.2020.04.000101*

Assessment of Contribution of Non-Timber Forest Products in the Socio-Economic Status of Peoples in Eastern Ethiopia

Zenebe Reta[1]*, Yisak Adgo[2], Tigist Girum[1] and Nimona Mekonnen[3]

[1]Mettu University, Ethiopia

[2]Environment and Forest Research Institute, Diredawa, Ethiopia

[3]Hawassa University, Ethiopia

*Corresponding author: Zenebe Reta, Mettu University, Ethiopia

Abstract

A study was carried out to assess the contribution of Non-Timber Forest Products (NTFPs) to household food security and income generation in villages surrounding at study area .Specifically, the study aimed at assessing the common NTFPs utilized by households in the study area, examining socio-economic factors influencing household members accessibility to NTFPs, evaluating the contribution of NTFPs to household food security and income. structured questionnaire was administered for primary data collection. Secondary data of NTFPs collection and crop production were collected from District Forest Office and District Agricultural Office respectively. Data analyzed by using SPSS software. Descriptive and inferential statistics were determined. Inferential statics were employed whereas linear regression analysis was used to determine the socio-economic factors influencing collection of NTFPs and pair t test were used to compare various income from NTFPs and other sources Results showed that: there was significant increase of NTFPs collection in the study aera Results also showed that there was positive relationship between collection of NTFPs and some socio-economic variable including household size, age, education, occupation and duration in years of staying in the area. Non-Timber Forest Products accounted for 100.0% of all respondents in the villages; however they also engaged in other production activities. It also indicates that NTFPs are utilized either directly or indirectly as solution to food insecurity and low incomes among the households. Results further showed that income from selling NTFPs is higher than from other sources such as selling agricultural produce, selling livestock, business, labour wages and employment in the study area. The study recommends that the government should employ more forest officers and provide education on direct economic importance of NTFPs.

Introduction

Non-timber forest products (NTFPs) are any product or service other than timber that is produced in forests. They include fruits and nuts, vegetables, fish and game, medicinal plants, resins, essences and a range of barks and fibres such as bamboo, rattans, and a host of other palms and grasses. On-Timber forest products play a vital role in livelihood of people in & around the forest [1]. Non – Timber forest products (NTFPs) comprise medicinal plants, dyes, mushroom, fruits, resins, bark, roots and tubers, leaves, flowers, seeds, honey and so on Lacuna-Richman C [2]. NTFPs (also called as "minor forest products" in national income accounting system) are source of food and livelihood security for communities living in and around forest. They are also known as Non-wood, secondary, special or specialty forest products [3]. According to FAO, NTFPs defined as "all goods for commercial, industrial or subsistence use derived from forest and their biomass". At global level, more than two billion people are dwelling in forest, depending on NTFPs for subsistence, income and livelihood security [4]. NTFPs are considered to be important for sustaining rural livelihoods, reducing rural poverty, biodiversity conservation, and facilitating rural economic growth.

An estimated 80 % of the population of the developing world uses NWFP to meet some of their health and nutritional needs FAO. It is an important source of income for the poor in many developing countries. In addition, several opportunities for improved rural development are linked to NTFPs [5]. NTFPs are important forest products especially in dry land areas where they form alternative

sources of livelihoods. They also contribute to poverty alleviation through generation of income providing food and improved nutrition, medicine and foreign exchange earnings Chikamai N [6]. There is therefore a growing awareness of the contributions of NTFPs to household economies, food security, national economies and conservation of biodiversity. Non-Timber Forest Products provide food, medicines, fibres and cash income for rural households [7]. The importance of non-timber forest products goes beyond meeting basic needs since the products are also among the rapidly growing markets sectors. Future development of NTFPs offers potentials for increasing income, expanding opportunities and diversifying enterprises in rural areas. People all over the world have been living on NTFPs because these come in a variety of items namely: food, forage, roughage, medicine, fuel, fibers, tannin, resin soils, spices and a host of others. The forest is the major source of their livelihood and subsistence by providing them a variety of NTFPs. There has been renewed interest in the development of non-timber forest products (NTFPs) as an instrument for sustainable rural development. In this paper, NTFPs can be defined as forest products other than timber, such as vegetable, mushroom, palm fruit, locust-bean, mango fruit, orange fruit, guinea pepper, honey, gums, palm wine, etc

Non-timber forest products constitute an important source of livelihood for millions of people across the world. The NTFPs form alternative sources of livelihood, contribute to poverty alleviation through generation of income, and foreign exchange earnings [8]. The collection of Non-Timber Forest Products (NTFPs) for house construction and household use is also widespread.This is mainly driven by poverty and household food insecurity caused by lack of means to invest in better quality housing and non-wood substitute products

Statement of the Problem and Justification of the Study

One of the difficulties for small-scale collectors who seek to commercialize NTFPs is that often the markets for these products are relatively complex compared to those for timber and traditional agricultural goods. Prices for NTFPs vary across different locations as well as over time. In addition, buyers also impose different quality control standards. Collectors are frequently rural people who are often poor or landless. All these factors contribute to complexity of NTFP markets leading to the problem of food insecurity by influencing the household income of the people dependent on it. The people dependent on this by enhancing their income and in turn increasing their purchasing power, which creates economic access to food. So far very few studieshave been done in the study area focusing poor situation of tribal economy. This study tries to fulfill this gap by analyzing the contribution of NTFP towards food and livelihood security. they also contribute to poverty alleoovoiation through generation of income, provision of food, medicine and foreign exchange earnings. It has been argued that the importance of NTFPs to household food security and income equals or surpasses; that of other products (i.e. non- NTFPs) yet their worth and potential are rarely quantified [9].

Objectives Of The Study

General Objectives

The main objective of this study is to assess the contribution of NTFPs to household food security and income generation in villages around eastern Ethiopia.

The specific objectives of the study were to

1. Assesses the common NTFPs utilized by household in the study area

2. Examine socio-economic factors influencing household member's accessibility to NTFPs

3. Evaluate the benefit of NTFPs to household food security and income.

Literature Review

Overview Of Non-Timber Forest Products

FAO (2010) defines NTFPs as: "products of biological origin other than wood derived from forests, other wooded land and trees outside forests". They may be gathered from the wild, or produced in forest plantations, agroforestry schemes and from trees outside forests. Non-timber forest products (NTFPs) include forest plants and mushroom products, fruits, charcoal, vegetables, honey, firewood, building materials and services. NTFPs are also goods of biological origin other than timber derived from the forest or associated ecosystems.

NTFPs are goods of biological origin other than timber derived from the forest or associated ecosystems which are consumed directly as food, \medicine or which contribute non-consumptive values to human welfare (FAO, 2008). The non- consumptive uses may include microclimatic amelioration, soil and watershed protection and conservation as well as aesthetic and cultural values [8].

Non-Timber Forest Products and Rural Livelihoods

NTFPs are an important tool in addressing poverty issues for marginalized, forest dependent communities, by contributing to livelihood outcomes including food security, health and wellbeing and income (FAO, 2001). In many parts of the world these resources are critical especially

for rural poor and women, and may provide them the only source of personal income (FAO, 2010). Forest products have been identified as a source of livelihood mainly for rural households [10-12]. Although the timber industry is often discussed in the context of its contribution to both national and local economies, but NTFPs receive little notice from social scientists and development planners [11], perhaps because of the small scale and dispersed nature of extractive activities.

Chikamai and Tchatat [13] note that most non-wood forest products in Sub-Saharan Africa provide both social and economic benefits to the livelihoods of rural communities. At the subsistence level, these products normally address livelihood strategies like secure provision of food, health care needs, and concerns to reduce risk factors. Shackleton C & Shackleton S [12]. reported that adhoctrade in NTFPs is a common safety net for rural households in South Africa and other African countries (for example, as a fall back for income in the off season or during periods of weak crop yields), which in some instances becomes a permanent source of livelihood. Although the cash incomes from NTFP trade are small, they provide an important contribution that complements the diverse livelihood strategies within a household, especially for the poorer sectors of rural society.

In developing countries, most of the rural households and a large proportion of urban households depend on NTFPs to meet some parts of their nutritional, health, and raw material needs, and for income from selling these products in local markets. In some cases, NTFPs are the only source of income for local communities [14], and they form an integral part of the rural economy. Muino [15] observed that non-wood forest products are an important source of livelihood for rural communities in Mozambique especially during times of economic, social, or bio-physical shocks. In economic bases the NTFPs play an important role in of income generation to rural household in developing countries. NTFPs also offer an expanding livelihood options and accumulation of wealth and assets required to reduce livelihood problems in rural areas such as food and income [16]. The NTFPs used as copping strategy during bad weather when the intended crops fail in rural areas in developing countries [16].

Livelihoods Framework

A livelihood is a means of making a living. It encompasses people's capabilities, assets, income and activities required to secure the necessities of life. According to, capability refers to ability human being to make a good life, and that, living a good life is the opportunity rather than the accumulation of resources; thus, accumulations of resources doesn't matter for an individual to have good life except that, he or she get opportunity for transforming resources into well-being. Livelihood is also defined as adequate stocks and flows of food and cash to meet basic needs. Three fundamental attributes of livelihoods are the possession of human capabilities such as education, skills, health; access to tangible and intangible assets; and the existence of economic activities [17]. Interaction between these attributes defines the livelihood strategy a household will pursue [18]. Livelihoods are not localized phenomena, but connected by environmental and other processes to wider national and global arenas. NTFPs can increase house hold food security and income in many families [16]. A livelihood will only be sustainable when it can cope with and recover from external stresses and shocks [18].

NTFP And Community Welfare

NTFPs extracted by the community members living in or around the area forest and these NTFPs utilized directly by the family or indirectly by exchange by sale and buy food. Direct and indirect consumption of NTFPs contribute to household food security and income and resulting to welfare of households and communities. NTFPs are known to be a particularly important component of household subsistence especially food consumption. It is estimated that 80% of the people in the developing world use NTFPs for health and nutritional needs (FAO, 2010). NTFPs tend to provide an important non-financial supplement to the livelihoods of rural people.

The Focus On Income And Food Security

Much of the initial thinking had focused on national food supplies, self-sufficiency and price. Physically available food comes from forests and trees, valuable sources of wild and domesticated foods; rights of use and access to trees and forests mediate whether or not these resources are economically available; wild and domesticated foods from trees and forests have well-documented nutritional values; food from forests and trees have an important safety net function that can be harmed by forest loss and land conversion [9].

Role Of Medicinal Plants In Economy Of Local Inhabitants

Still, NTFPs remain an important source of income for the rural poor throughout the developing world, especially in Sub-Saharan Africa. The study revealed that households purchased significantly more NTFPs as wealth increased, and a greater proportion of wealthy households did so. On the other hand, a greater proportion of poor households were involved in the sale of one or more NTFPs, and they sold greater quantities and volumes per-household, as compared

to wealthy households. Jimoh [11] reported that in Nigeria's rural areas, NTFPs contribute significantly to household income and food security and thus, play an important role in poverty reduction. He noted that income from sale of forest products constitutes a substantial amount of total household income in Nigeria. Most households in rural areas of developing countries obtain wild fruits, vegetables, and edible insects from the forests for household consumption and/ or commercial purpose. In a study of the contribution of N/TFPs to livelihoods in Vietnam from a commercial point of view, Quang and Anh [1] found that in an open economy where trading is free, NTFPs support both cash income and employment. Therefore, commercialization of NTFPs in poorer communities has potential for trade expansion and is expected to increase employment opportunities as well as rural household incomes.

NTFP And Sustainability

It is often assumed that NTFPs are sustainably harvested and that this "green social security" will always be available to resource users. This is not always the case. The early interest in NTFPs was encouraged by the belief that NTFP commercialization that added sufficient value to forest products could contribute to forest conservation Clement CR [19]. Several scientists have stressed that NTFPs can be harvested without much destruction of the forest, while maintaining essential environmental functions and preserving biological diversity [20]. The extraction of NTFPs is considered sustainable if it has no long-term deleterious effect on the regeneration of the harvested population, and when the yield remains more or less constant throughout the years [21].

Never the less, uncontrolled extraction due to population increases, high demand for NTFPs and low prices has caused species extinction and forest degradation in many countries [22]. Unsustainable harvesting of NTFPs does have a number of ecological impacts, including a gradual reduction in the vigor of harvested plants, animals, as well as decreasing rates of seedling establishment of harvested species, potential disruption of local animal populations and nutrient loss from harvested material [23].There was ample evidence of over-harvesting even at the time that NTFP exploitation was promoted as nature conservation strategies according to Sunderland et al [24]. There was also an assumption, often implicit [25], that making forests more valuable to local users can encourage forest conservation and poverty reduction [26]. Moreover, NTFPs are more accessible to the poor [27]; contribute to foreign exchange earnings [28]; and support biodiversity and other conservation objectives [29]. Furthermore, NTFPs can be harvested with relatively little impact on the forest environment [30].

NTFP Cultivation

Higher demand increases pressure on the resource and as resources become depleted, three main strategies are employed to militate against shortfalls in supply: travel further to find the product, substituting the particular product with a similar product or to develop a more intensive or cultivated sources of supply [21]. As a result of the recognition that the extraction of NTFPs from natural forests has limited potential for improving household economies, several scholars began to question whether the objective of Enhancing forest-based livelihoods through NTFPs could not be better fulfilled by optimizing NTFPs production through domestication [31]. Ahenkan and Boon [26] state that it is incorrect to suggest that NTFPs can be harvested indefinitely without proper management practices and domestication to sustain their yield and therefore call for the need for intensification of management and semi-domestication of these products of forest origin, including honey, mushrooms, snails, grass-cutters, medicinal and aromatic plants and fruits.

The contribution of NTFPs to improving livelihoods can best be assured through a process of gradual domestication of NTFPs in human-modified (agro) forest types. notes that intensified management and domestication of NTFPs may be an important means of improving livelihood of poor through higher yields, improved and more consistent quality and control over the timing of harvests and reduce pressure on wild and presumably endangered resources.

Methodology

Study Area Description

It has bimodal rain fall distribution which experiences two rainy seasons, the minor in spring and the major in summer. The maximum rain fall of the area is 800mm and the minimum is 700mm.The average maximum and minimum temperature of the study area are 26.8ocand 24oc respectively. The community were followed mixed farming system mostly. From Agricultural office (2011, E.C).

Sampling Design

The research design used in this research were descriptive statistics, the Questionnaires' and data's collected were analyzed and interpreted in the form of tables, figures and graphs.

Nature and Sources Of Data

In this study both primary and secondary sources of data were used. Primary source of data were obtained from the personal observation, questionnaire and survey results. Secondary source of data were collected in the form of

reviewing different related literatures and other documents like books magazines and profiles which is stated about the non-timber land forest products.

Data Collection

In this research the data was collected through questionnaire and interview methods. Direct field observation was prepared on the issue related to the contribution of NTFPs to tribal income and employment; identify the economics of NTFPs collection by the community and the main factors affecting communities' livelihoods and possible coping mechanism.

Sampling Technique

The researchers select to use simple random sampling method to select the participants from the total population of the farmers. According to the Keble administration office in 2011E.C .

Data Analysis

Finally the research was analyzed through descriptive statistics, Qualitative data were analyzed through interpretation and quantitative data was analyzed through frequency distribution percentage. Was calculated and interpreted accordingly to the obtained data results.

Results And Discussion

It is concerned with the analysis of data which we obtained in the form of personal observations, questionnaire and survey from the field. The detailed results of the study are explained under following heads. According to the obtained data from the research participants through observation, and interview the NTFP products found in the study area were:-

1. Pterolobiumstellatum (kontir)
2. Vernoniaamygdalina (Grawa)
3. Vernoniaspp(wild grawa)
4. Kazaba
5. Croton macrostachyus(bisana)

NTFPS for livelihood

The study reveals that broadly majority of the people (42.85 %) are using NTFP for their own consumption followed by 39.68 % for medical treatment and only 17.46% are involved in income generation through NTFP

The study reveals that Majority of the respondents (90.48%) depends on forest for fuel wood. 60% of the total respondents were of the view that they collect fodder from the forest. 39 % of the total respondents also said that they depend on the forest for honey collection. There were also significant benefits accruing from environmental goods and services such as water from catchments forests, increasing rainfall and spiritual sites present in the forests. These NTFPs contributed to both monetary and non-monetary benefits, which acted as incentives for sustainable forest management (Table 1).

Table 1: NTFP utilization in the study area.

NTFP product	Total Respondent	Total dependent	% of total
Firewood	63	57	90.48
Fodder	63	38	60.32
Honey	63	25	39.68
Game	63	7	11.11

NTFPS For Commercial Utilization

On the basis of discussion with respondent it was clear that NTFPs are a part of high income commercial operations, especially those based on engineered bamboo or medicinal plants. NTFPs are also important as they provide income generation for those outside the standard economic systems. For edible products, poorest people recur to the forest during the months in which agricultural products become scarce and less diverse (at the end of the dry season and the first months of the rainy season).

Significance of NTFP for Climatic Amelioration

Another non -timber forest product that has recently become important is the storage of carbon within trees bellows the (Figure 1). Trees are composed of approximately 50% carbon and, therefore, as they grow, they can capture

Figure 1: Standing forest carbon.

and store (sequester) carbon. The potential to sequester carbon in solid wood products has received quite a lot of attention, since these wood products can be viewed as reservoirs for carbon storage if they remain in solid form. The interest in carbon as a product of forests has

been prompted by the growing concern of global climate change, which is linked to increasing levels of carbon dioxide (CO2) in the atmosphere. In short, large amounts of carbon dioxide are emitted into the atmosphere from the combustion of fossil fuels, such as coal and gasoline. In addition, deforestation contributes to this emission through the loss of sequestration activities, decomposition of woody residues, and fires that may be used to clear areas for agricultural or developmental activities. Trees may be able to capture some of this carbon dioxide through the photosynthetic process.

During discussion with the respondents it was observed that people in the study area are well aware abut climatic amelioration effect of NTFPs if not harvest sustainably. Respondent are well aware about Good forest management secures the survival of forest ecosystems and enhances their environmental, socio-cultural and economic functions. It can both maximize forests' contribution to climate change mitigation and help forests and forest-dependent people adapt to new conditions caused by climate change. Improved forest management practices for climate change mitigation and adaptation should be planned and implemented in tandem, as they are closely linked.

The Role of Ntfps for Sustainability of the Community

The finding result from the local community interview result indicates: - As such, forests provide a cheap alternative for food, medicines and building materials in times of economic hardship. For edible products, they present some evidence to suggest that the poorest people recur to the forest during the months in which agricultural products become scarce and less diverse (at the end of the dry season and the first months of the rainy season). In these months, poor households increase the use of game to supplement their diet; a peak that could not be observed among the more wealthy households. The strongest indication that the forest functions as a safety net can be seen in the seasonal consumption of wild banana; a forest product considered inferior compared with the domesticated species and which is hardly consumed by the wealthier households.

The second trend that can be observed is that new income-generating opportunities emerge as a result of increasing exposure to markets. This occurs at local scale, where improved infrastructure gives more people access to urban markets, but also at global scale, where new markets are being opened up as a result of globalization and liberalization. Consequently, the trend in commercialization is increasing, creating new alternatives to earn cash income. The perceived value of medicinal products and their utilization could increase villagers' motives and incentive for sustainable forest management as well. This observation is in line with the arguments of Arnold and Perez (2001) who reveal that the exploitation of NTFPs provides more sustainable base for forest resource management. This could have been attributed to seasonality of forest fruits which makes them unavailable during certain seasons. Additionally, wild fruits were increasingly being domesticated in the farmlands and home gardens. Nevertheless, the importance of various NTFPs at household level depends on the dynamics of people's livelihoods, income needs, composition and condition of the forest resources and access to market (Figure 2 & Table 2).

Figure 2: NTFPs used for medicinal purposes in the study area.

Table 2: Factors affecting NTFPs.

Factor or constraints	Respondent agree	%
Insecurity of resource base	32	50.79
Climatic factors	13	20.64
Fire	10	15.87
Grazing	8	12.70
Total	**63**	100 %

Insecurity of Resource Base

The most important constraints to development and promotion of NTFPs in the study area were insecurity of resource base particularly tenure of both land and trees. This was mentioned by about 50% of the respondents. Access to land in the study area was regulated bay dual system of tenure that is a customary or traditional system and a modern system. In the traditional system, membership of a particular tribe was sufficient to confer land access. Individuals, who were not members of the tribe, but resident in the area, could obtain access to land by application to

the tribe leaders. The modern land tenure regime was represented by the land registration system enacted by the government. The system recognized individual ownership rights over land.

Climatic Factors

The diversity and availability of NTFPs in the study area were threatened by the changing ecological conditions. About 20% of the respondents mentioned changes in climatic conditions as one of the constraints to the development, utilization, domestication, sustainability and commercialization of NTFPs.

Fire

About 15% of the respondents mentioned that fire is the main constraints to NTFPs in the study area. The fierce and extensive bush-fires were annually started by lightning, by nomads in search of grazing, by honey gatherers and by cultivators practicing shifting cultivation. This had great influence on the presence or absence of particular tree species and affected the growth form of individual tree. In addition, the fire killed the newly established saplings and reduced soil seed banks by killing trees and grass seeds. Eventually, natural regeneration was greatly affected (Figure 3).

Figure 3: Women collecting firewood in the forest area.

Grazings

Grazing was mentioned by 15% of the respondents as a threat to NTFPs. Traditionally, the study area hosts a large number of livestock both owned by sedentary and transhumance inhabitants. Moreover, during the dry season the study area is the most favored grazing sites for nomadic tribes.

Conclusion and Recommendation

Conclusion

Based on this study it is concluded as follows:

There were various NTFPs available in the forest which collected by the household's members living around the forest which contribute to their livelihood. Those NTFPs are wild vegetable, firewood, medicinal plants, poles, ropes honey and fodder.Based on the finding results it is concluded that people of the district area are dependent on NTFP such as Vernoniaamygdalina (Grawa),Vernoaspp(wildgrawa),Phytolaccadodecandra (endod),Kazaba, Croton macrostachyus (bisana) , Ocimumlamifoliu (Demakase), Rutacheplensis (Tenadum), and Lepidiumsatium(feto) etc. Majority of the community members are using non-timber forest products for consumption, followed by medicinal values and for income generation. This implies that the NTFPs play an important role from socio-economic point of view.

The present finding also indicate that forest provide a cheap alternative for food, medicine and building material in times of economic hardship. The obtained data from the research participants from the study area states that the NTFPs were significant to alleviating poverty reduction in community. The study revealed that the most collected NTFPs in the study area are firewood (90%), fodders (60%), and honey (40%). The other benefits that it offers are environmental, water harvesting. Wildlife protection etc. The major factors that affect non timber forest production in the study area were insecurity of resource base followed by climate factor, fire and grazing etc [32].

Recommendations

1. Domestication and sustainability of NTFPs are some issues which required to be addressed for commercialization of NTFP which will help in uplifting of their socio-economic status.

2. The awareness of the public regarding sustainable use of NTFPs is also must.

References

1. Quang DV, Anh TN (2006) Commercial collection of NTFPs and households living in or near the forests: Case study in Que, Con Cuong and Ma, Tuong Duong, Nghe An, Vietnam. Ecological economics, 60(1): 65-74.
2. Lacuna-Richman C (2002) The socioeconomic significance of subsistence non-wood forest products in Leyte, Philippines. Environmental Conservation, 29(2): 253-262.
3. Shiva MP (1993) Technology scenario in asia-pacific forestry sector. APFSOS Working Paper no. 25 Forestry Policy and

Planning Division.

4. Vantomme P (2003) Forest products division. Forestry Department. Food and Agriculture Organization, Rome, Italy.
5. Adepoju AA, Salau A S (2007) Economic valuation of non-timber forest products (NTFPs).
6. Chikamai N (2003) Review and synthesis on the state of knowledge of Boswellia species and commercialization of frankincense in the drylands of Eastern Africa.
7. Okafor JC, OmoradionF, Amaja FI (1994) Non-timber forest products (Nigeria): Consultancy paper prepared by the Evaluation and Co-ordination Unit (FORMECU) and Federal Department of Forestry (FDP) Abuja.
8. Mulenga BP, Richardson RB, Mapemba LD, Tembo G (2011) The contribution of non-timber forest products to rural household income in Zambia (No. 1093-2016-88076).
9. Chidumayo EN, Gumbo DJ (2013) The environmental impacts of charcoal production in tropical ecosystems of the world: A synthesis. Energy for Sustainable Development 17(2): 86-94.
10. Jumbe CB, Bwalya SM, Husselman M (2008) Contribution of dry forests to rural livelihoods and the national economy in Zambia. World Bank and CIFOR.
11. Jimoh SO (2006) Sustaining the roles of non-timber forest products in rural poverty-reduction and household food security in Nigeria.
12. Shackleton C, Shackleton S (2004) The importance of non-timber forest products in rural livelihood security and as safety nets: a review of evidence from South Africa. South African Journal of Science 100(11): 658-664.
13. Chikamai B, Tchatat M (2004) Forest management for non-wood products and services in Africa. A Report prepared for the Project: Lessons Learnt on Sustainable Forest Management in Africa. AFORNET, Nairobi.
14. Wollenberg E, Nawir AS (1998) Estimating the incomes of people who depend on forests. Incomes from the forest: methods for the development and conservation of forest products for local communities. 157-187.
15. Muino IT (2009) Non-wood forest products: the forgettable side of forest sector revenues in Mozambique: Mozambique and non-timber forest products: uses and perspectives. In XIII World Forestry Congress p. 18-23.
16. Dewees P (2013) Bouncing Back: Forests, trees, and resilient Households
17. Chambers R, Conway G (1992) Sustainable rural livelihoods: practical concepts for the 21st century. Institute of Development Studies, UK.
18. Carney D (1998) Sustainable livelihoods. Sustainable Livelihoods: What contribution can we make.
19. Clement CR (1993). Non-Timber Products from Tropical Forests: Evaluation of a Conservation and Development Strategy. BioScience 43(9): 644-647.
20. Anderson AB (1990) Alternatives to deforestation: steps toward sustainable use of the Amazon rain forest.
21. Cunningham AB (1997) An Africa-wide overview of medicinal plant harvesting, conservation and health care. Medicinal plants for forest conservation and health care 11: 116-129.
22. Browder JO (1992) Social and economic constraints on the development of market-oriented extractive reserves in Amazon rain forests. Advances in economic botany p. 33-41.
23. Peters C M (1996) The ecology and management of non-timber forest resources. The World Bank.
24. Sunderland TC, Besong S, Ayeni JS (2003) Distribution, utilization and sustainability of non-timber forest products from Takamanda Forest Reserve, Cameroon. SI/MAB Series 8: 155.
25. Belcher B, Ruiz-Perez M, Achdiawan R (2003) Global patterns and trends in NTFP development. In International Conference on Rural Livelihoods, Forests and Biodiversity
26. Ahenkan A,Boon E (2008) Enhancing food security, poverty reduction and sustainable forest management in Ghana through non-timber forest products farming: case study of Sefwi Wiawso District. Case Study of Sefwi Wiawso District.
27. Saxena NC (2003) Livelihood diversification and non-timber forest products in Orissa. Wider lesson on the scope for policy change?Working paper 223. @ overseas Development Institute London, UK, p. 69.
28. Shiva MP, Verma SK (2002) "Approaches to sustainable forest management and biodiversity conservation: With pivotal role of non timber forest products."
29. Marshall EAC, Newton, Kate Schreckenberg (2003) "Commercialisation of non-timber forest products: first steps in analysing the factors influencing success." International Forestry Review 5(2): 128-137.
30. Myers N (1988) Tropical forests: much more than stocks of wood. Journal of tropical ecology, 4(2): 209-221.
31. Kusters KOEN (2001) "The potential contribution of non-timber forest product extraction to tropical forest conservation and development: Lessons from a case study of bamboo utilisation in a Sierra Madre community, the Philippines." Journal of bamboo and rattan p. 77-94.
32. Campbell JY (1991) Case studies in forest-based small scale enterprises in Asia. Rattan, matchmaking, handicrafts. Community Forestry Case Study (FAO).

*Corresponding author: : Zenebe Reta, Email: zenebereta98@gmail.com

Citation: Zenebe Reta*, Yisak Adgo, Tigist Girum and Nimona Mekonnen. Assessment of Contribution of Non-Timber Forest Products in the Socio-Economic Status of Peoples in Eastern Ethiopia. Op Acc J Bio Sci & Res 4(4)-2020.

DOI: *10.46718/JBGSR.2020.04.000101*