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RESEARCH ARTICLE

PRACTICES, CHALLENGES AND OPPORTUNITIES OF SUSTAINABLE FOREST MANAGEMENT IN NONO SELE WOREDA, SOUTHWEST ETHIOPIA

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ABSTRACT

Ethiopian montane rainforests are economically valuable repositories of biodiversity, especially of wild *Coffea Arabica* populations, and they are vanishing at accelerating rates. The general objective of this study was to examine the existing sustainable forest management practices, challenges and opportunities in Nono Sele woreda, southwest of Ethiopia. A two-stage random sampling technique was employed to select the 241 sampled households from five rural kebeles. Questionnaire survey, key informants interview, focus group discussions and personal observation were employed to collect primary data. The Statistical Package for Social Science (SPSS version 23) was used to analyze the data. Results revealed that the major sustainable forest management practice were both indigenous practices namely, Kobo system and other conservation ways includes exercise non-timber forest production, implementation of PFM project, controlling forest fire, creating environmental awareness to manage the natural forests. The findings also indicated that increase demand for farmland, rising demand for coffee prices, lack of management system and weak institutional arrangement were the main challenges to sustainable forest management, while ecotourism, economic benefits, ecological benefit and REDD+ implementation identified as the potential opportunities of sustainable forest management in the study area. Thus, this study suggests that the government should acknowledge and integrate indigenous forest management practice into future sustainable forest management and conservation strategies.

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INTRODUCTION

Forest cover is the area covered under vegetation with a tree canopy cover of more than 10% and area of more than 0.5 ha (FRA, 2005). Forests are home to more than 80% of the world's terrestrial biodiversity, and provide food, medicines, fuel and critical ecosystem services, provide essential environmental services such as land conservation, watershed management, protection against floods and landslides and provide industrial wood (FAO, 2006). According to Demele (2001), forests provide ecological, economic, social, and aesthetic services to natural systems and humankind, including refuges for biodiversity, provision of food, medicinal, and forest products, regulation of the hydrologic cycle, protection of soil resources, recreational uses, spiritual needs, and aesthetic values. Additionally, forests influence climate through exchanges of energy, water and carbon dioxide in the atmosphere. Forests have multifarious functions and uses to mankind and other living organisms. Forests play indispensable roles in the life support systems on our planet.

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Problems of deforestation and serious damage to our natural environment are the major threat to the life support system of our planet and to human existence itself. The roles played by local communities in sustainable use of forest resources have been recognized by researchers and even policy-makers and politicians. However the level of recognition may be, as practice and studies revealed it has not been possible to stop the destruction of these precious resources, mainly by human activities. There are studies on the type of plant resources in natural forests of different parts of the country (Demele, 2001)). These conclude existence of plants of high economic and social values to the local community, the nation as well as to the globe. Nevertheless, the economic value of Ethiopian forests are often overlooked, although they are sources of fruits, medicinal plants, spices, coffee, kororima, ginger, gum and incense, honey, bamboo, firewood, building materials in addition to their ecological functions and services. Households in many parts of southwest Ethiopia are highly dependent on forests for their daily existence and livelihoods by harvesting fruits, coffee, spices and other products (Yitebitu, 2012). Thus, degradation of natural forest and environmental deterioration has greater negative impact on livelihood of the local people living in or adjacent the area in addition to its global effect.

The problem is serious in the case of state forest resources due to low enforcement capacity of formal institutions and breakdown of indigenous institutions that were used to regulate resource utilization. This leads to open-access the areas and resource degradation.

Problem of the statement: The loss of forest cover on the highlands has resulted in soil erosion, land degradation, loss of biodiversity, and impoverishment of ecosystems which in turn has affected, and still continues to affect human and plant as well as animal welfare (Demel, 1996). Highland forests of Ethiopia are important for streams and water conservation rather than for their commercial values (Yitebitu, 2012). Ethiopia is a country currently facing a high deforestation rates and loss of its rich natural resources. Tadesse (2005) stated that about 60% of the forest cover of the highland plateau of SW Ethiopia was lost due to manmade destruction during the last thirty years. It has also been stated (Ruesing, 1999) that 9000 km² of closed high forests were destroyed between 1973 and 1990 (Demele, 2001)). Similarly about 50% of natural high forests were found to have been degraded to slightly or heavily disturbed forestlands in the period from 1971 to 1997 (Demele, 2001). Wolde Mariam (2005) reported rapid loss of forest in Yayo and Sheko areas in the southwest mainly due to deforestation. According to him, previous attempts to conserve the forests in general and the coffee forests in particular were precarious and did not have significant impact. Forest destruction occurs when locals clear forests for their personal needs, like fuel, hunting, agriculture, housing development. The main challenge to sustainable forest management in Ethiopia includes population pressure (expansion of agricultural land), overgrazing, and timber cutting for construction, fuel and wildfire, expansion of plantation (FAO, 2011).

The unchecked deforestation activities and damage to our environment are caused by many factors such as population pressure, expansion of agricultural fields, and unsustainable development approaches through laws, policies, strategies and programs. Deforestation activities which are extremely intensified in recent years for various reasons, are now threatening the country very seriously. If the present situations continue unabated, the country will remain without natural forest in the near future. In countries like Ethiopia with agrarian society, where the great majority of people and their way of life (rain-fed agriculture) are highly dependent on natural resources, the loss of the remaining forests would have catastrophic consequences. Laws have been put in place to protect the environment, mainly forests and the wildlife, since long ago. There is global concern over the fate of the tropical rainforests and the people who depend on them as, on average, 60% of tropical forests have been destroyed (Cernea & Soltau, 1998). Ethiopia shares the problem with other tropical countries. The country has lost most of its forest cover. In particular, the study area, Nonno Salle forest, is facing serious encroachment from commercialized perennial crop production like coffee plantation, which is currently becoming an important threat to the ecosystem. There is a need to understand the impact of the change in the belief system of the community and its link with the expanding forest degradation in order to tackle the problem. The base line survey is needed to show the real potential value of the natural forest in the study areas. Thus, it suggests the need to opt for other possible mechanisms that can preserve the value of the natural forest without hindering the desired rural development. Detailed

study on potential opportunity value of natural forests in Ethiopia is scant. Therefore, potential opportunity of Nonno Salle natural forest is hoped to give baseline information which may serve as an input in showing its value for informed decision making and to advocate for its conservation. Moreover, this study suggests other possible mechanisms to enhance sustainable natural forest management practices and rural development in the area. It may also help as a stepping-stone for further detailed research to reveal the value of Nonno Salle natural forest. In particular this baseline survey is supporting the development of a variety of forest-based enterprises which will add value to the forest and so make it attractive for REDD+ supported carbon payment may be one way in which the portfolio of benefits can be expanded. Multi kebele cooperatives have been established to create viable organizations for the marketing of forest products. On the other hand the study will also to show the gap observed regarding sustainable forest management at Woreda and identifies best indigenous forest management practice and gives recognition. This base line survey hence, seeks to fill sustainable forest resource management practices, challenges, and potential opportunities current observed in the forest of Nonno Salle. This leads to the next agenda of the same research process involving identification of rules and regulations in developing guidelines for forest management.

Objective of the study

General Objectives: The general objective is to assess sustainable forest resource management practices, challenges, and opportunity in Nonno Salle woreda of Ilubabor Zone, South West Ethiopia.

MATERIALS AND METHODS

Study area description: The study was conducted in five rural *kebeles* (the smallest administrative unit in Ethiopia), named Gemechisa, Welkitesa, Kimo, Qoti and Onose, which are found in Nonno Salle woreda within Ilubabor administrative zone, southwest Ethiopia (Figure 1). The woreda lies between 7° 27'-8°18' N latitude and 34° 52'-35°26' E longitude. The elevation of the study area varied from 1,444 to 2,244 m asl. Different landforms such as rugged mountains, deep gorges and extensive dissected plateaus are the main topographic features of the study area. According to the Ethiopian traditional agro-climatic classification system which mainly relies on altitude and temperature, more than 90% of the study area falls within *woina-dega* (subtropical) agro-climatic zone. The woreda covers a total area of 2861.18 km² with a total population of 27,616, of which 13,806 are male and 13,810 are female (Central Statistical Agency [CSA], 2013). The climatic condition in the area is generally humid. Rainfall shows unimodal distribution, with the main rainy season between June and September. According to FAO/UNESCO soil classification system, the major soils of the woreda are dystric nitisols (red-basaltic soil), dystric gleysols, orthic acrisol and orthic solonchaks are the most prevalent soils in the study area. Rainfed crop production such as maize (Zea mays) and sorghum (*Sorghum bicolor*) supported by livestock rearing is the main economy of smallholder farmers. Forest resources have always played an important role in the local economy.

Sampling technique: The study employed a two-stage sampling procedure that combined purposive and random sampling methods.

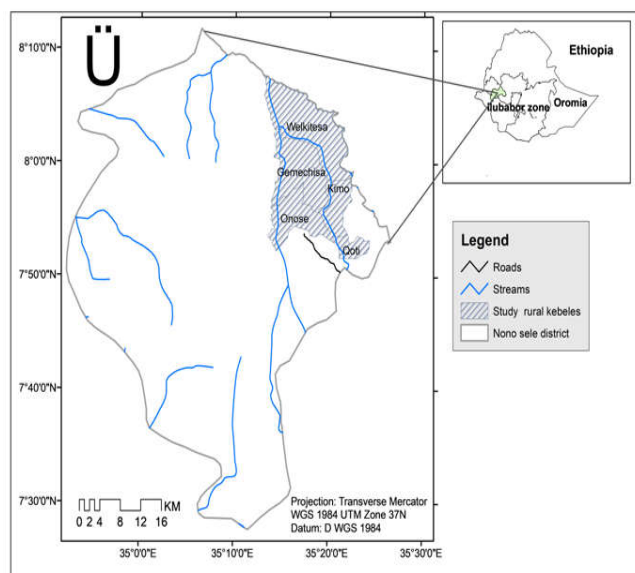


Figure 1. Location map of the study sites

Purposive sampling was used to select the study woreda due to maximum forest coverage, and the five rural *kebeles* were randomly selected. In the second stage, using the list of household heads from the respective rural *kebeles* administration offices, sample size was determined through probability proportional to size technique, which represent a sampling intensity of 10%. Then, a simple random sampling method was used for the selection of 241 respondents for households survey. The respective sample size for each rural *kebele* was calculated (see Table 2.1).

Table 2.1 Distribution of sample size of households from each selected rural *kebele*

Sample rural <i>kebeles</i>	Total households	Sample size
Gemechisa	446	45
Onose	653	65
Kimo	572	57
Koti	381	38
Welkitesa	363	36
Total	2,415	241

Source: Rural *kebeles* and woreda forest offices, 2018

Methods of data collection: Both qualitative and quantitative types of data were collected through primary and secondary methods of data collection. The primary data were collected through household survey questionnaire, focus group discussions (FGDs), key informant interviews and field observations between October and November 2018. Secondary data were also gathered from published and unpublished research journals, zonal and woreda offices and internet sources. The household survey questionnaire was conducted to gather information on practices, challenges and opportunities of sustainable forest management. The questionnaire was mostly composed of close ended questions. Open-ended texts were also included at the end of many of the survey questions to generate additional qualitative data from the respondents. In addition, key informant interviews, three focus group discussions (FGDs) and personal observations were also employed to triangulate and support the data obtained from the household survey. The data generated during interviews and focus group discussions were used to consolidate and triangulate the data obtained through the household survey.

Methods of data analysis: The data of the study were analyzed both quantitatively and qualitatively. The quantitative

data collected from household survey was analyzed using the Statistical Package for Social Science (SPSS) software version 23 and Microsoft excel 2010 spreadsheet. Qualitative data generated through key informant interviews and focus group discussions were used to augment and substantiate the qualitative analysis.

RESULTS AND DISCUSSION

Forest resource management practices: Resource management practices of people are based on their traditional ecological knowledge that is highly influenced by perception in worldviews. In the Nono Sele woreda there was long history of protecting the natural forest from degradation. According to the survey report gained from the selected sample *kebeles* there is best traditional way of forest resource management practice in the study areas, which is named as 'Kobo system'. According to key informants (KI) and focus group discussion (FGD) Nono Sele people social organization makes possible to manage the different categories of the environment. It provides different responsibilities of resource management to the people along their traditional layers starting from the Aba Kobo down to individuals and groups at grass-root level. Natural forest resource in the study area especially large forest areas are administered through the Kobo customary right system. The management of large forests (kobo) is based on the rights and obligations of the individual who inherited the forestland from his/her ancestors. The management of kobbo is based on customary rules that identify the rights and obligations of the individuals who have their own forests. Hence, kobbo is a portion of one's own inherited 'forestland' mainly used for harvesting honey and other NTFP. The owner has customary right to hang beehives for honey production and to collect different types of NTFP. The owner can also use timbers from his kobbo for making traditional beehives. KI and FGD during the study described that only owners can extract wild coffee, house furniture, agricultural tools, non-timber construction materials including different types of climbers and spices such as *Aframomum corrorima* and *Piper capense* for their own consumption and market sale. The holder of the forest who is allotted or has inherited a block is responsible for its management through traditionally known use and conservation rights. Many of the informants agree that other people are not allowed to use resources in kobbo for hanging beehive and extraction of other NTFPs unless it is beyond the knowledge of the owner of a particular kobo leader Aba Kobo.

Traditionally, Aba Kobo control the holder of kobbo who is responsible for illegal timber extraction and other damages brought within his boundary. The Aba Kobbo has the right to impose different forms of punishments on the illegal use of forest resources. Aba Kobo still provides informal advices for promoting conservation of resources in kobbo area. Selective hunting is also conducted in this part of the forest. Though few people have recently started to violate the rule, hanging beehive, hunting and cutting climber is a taboo that every member of the community in general observes. There is also a conception among the community that as protection of the forests ensures normal rainfall distribution. The protection of forest also protects wild animals as hunting in such forest is forbidden. The prohibition of hanging beehive (that has been violated in the past few decades), was to give shelter for bee colonies expelled from their hive in kobbo during honey harvest times in May. Resource and habitat taboos imposed on areas of kobbo forest have significant ecological importance

particularly to the conservation of forest and other resources conservation. They help prevent genetic erosion of plant and animal species and protect wild animals and bee colonies.

Table 3.1. Sustainable forest management practice in Nono sele forest woreda

Practices of sustainable forest management	Responses (%)	
	Yes	No
Launching afforestation and reforestation program	21.8	78.2
Exercise non timber forest production	73.7	26.3
Motivating community participation to plant trees	71.1	28.8
Controlling overgrazing	64.2	35.8
Implementation of PFM project	98.4	1.6
Creating environmental awareness	95.1	4.9
Controlling forest fire	97.1	2.9
Use alternative use of energy	19.3	80.7
Apply modern farming mechanism	3.3	96.7
Multiple income generating activities	9.1	90.9

Source: Field survey, 2018

The survey result reveals that different sustainable forest resource management was practiced in the study area. Launching afforestation and reforestation program, exercise non timber forest production, motivating community participation to plant trees, controlling overgrazing, implementation of PFM project, creating environmental awareness, apply modern farming mechanism, controlling forest fire, use alternative use of energy, multiple income generating action. Next to the traditional way of protecting forest resource from deforestation, there is also launching afforestation and reforestation program is one of forest management practice in the area. According to the field survey 21.8% of respondents showed as they launching afforestation and reforestation program. As already presented on above table 73.7% and 98.4% of respondents agreed us the NTFP and participatory forest management (PFM) project seeks to support the development of a community-based approach to forest management respectively. Currently, both the government and the owners control forest and NTFPs in kobbo area. Especially through PFM linked to enhanced production and trade in NTFPs, such as coffee, honey and spices, as well as other forest products. These developments require capacity building in government agencies and amongst communities, as well as institutional development with new forms of CBOs for PFM and trade. This must be a multi-stakeholder approach taking a landscape approach to resource management planning, as well as involving close cooperation with the government to ensure a suitable policy environment. The contemporary sustainable forest resource management and positive scenarios are appearing for the forests of the Nono Sele. In the first place the Federal and Regional government are committed to the application of participatory forest management (PFM) as the way to maintain the forest resources of the country.

The legal basis for this is being developed in a participatory manner with project support and a new regional forest proclamation has been approved. This, and the associated regulations, will provide clear and secure rights to the local communities over the forests and enhance the uses they can make of it. These benefits from the forest will balance the responsibilities of ensuring sustainable forest management which the communities now have. The other issue to sustainable forest resource management practice point out by household participant was creating environmental awareness which accounts 95.1%. Encouraging public action in advancing forestry, research, training and education to give

people a better understanding of how forests work and why they are important, and a change in public opinion so that more people appreciate the use and potential of forests, land reforms to reduce the mounting pressures on landless peasants caused by inequalities in land ownership, diversifying the livelihood of people who are dependent on forest resources to minimize their pressure on forests, protect forests from wild and human induced fire, Increasing the productivity of the existing cultivable land so that the pressure on the forest resources in order to get additional farm lands may reduce, Using alternative source of energy (solar, wind, geothermal, water), practicing agro forestry to enhance both the ecological and economic benefits, controlling overgrazing, balancing population growth rate so the pressure on forest resources will decrease, using alternative raw materials for construction and household furniture, Regenerate natural indigenous plant species rather than planting exotic trees, restrict unplanned resettlement, subsidizing afforestation and reforestation activities so that people could actively participate in afforestation program, Boycott products of companies involved in deforestation activities, raising the public awareness about the adverse effects of forest degradation on the environment at large and their livelihood in particular.

Challenges to sustainable forest resource managements:

The forests are under increasing pressure, primarily as a result of the clearance of land for smallholder agriculture due to population growth and in-migration. As illustrated in the figure 3.1, about 75.3% challenges to forest resource in the study area were because of increased demand for farm land, a need which is usually met through forest clearance. Also of note in this process is the way the present forest fringe farming systems require the clearance of forest land in response to declining yields on existing fields. This clearance of forest land has been accelerated in recent decades by improved communications and communities to maintain the forest in the long term. According to field observation and FGD, the natural forest was degrading from time to time due to coffee investment expansion in the area. This was also confirmed through field survey. Accordingly, the highest percentage (80.2%) of household survey responded as coffee investment expansion due to rising demand for coffee prices were one of the major challenges to unsustainable forest resource management in the study area. In the area, large scale coffee plantation expansion is becoming a threat to conservation of the natural forest. The demand for fuel wood depends on the family size and the varieties of dishes to be prepared per day. Rural and urban households in the region depend heavily on woody biomass for lightening and for their energy supply. The field survey results also verify this challenge. Accordingly 65.5% of HH respondents get energy from forest land. Hence, the indiscriminate cutting of trees for such purposes is causing not only the decline of the forest resources but also exposing the area to erosion and decrease in agricultural production. In the management of forest resources the first step is demarcation /defining/mapping but in two *kebeles* of the forest boundary demarcation is not completed. This will pave the way for free accesses of people in the forest land and promote for forest resource degradation. As point up on the above table one of the challenges to sustainable forest resource management was incomplete demarcation of forest area. The field survey revealed that 70% of major challenges to sustainable natural resource management were lack of job opportunities and 70.8%, lack of management system and weak institutional arrangement and lack of responsible body to conserve the

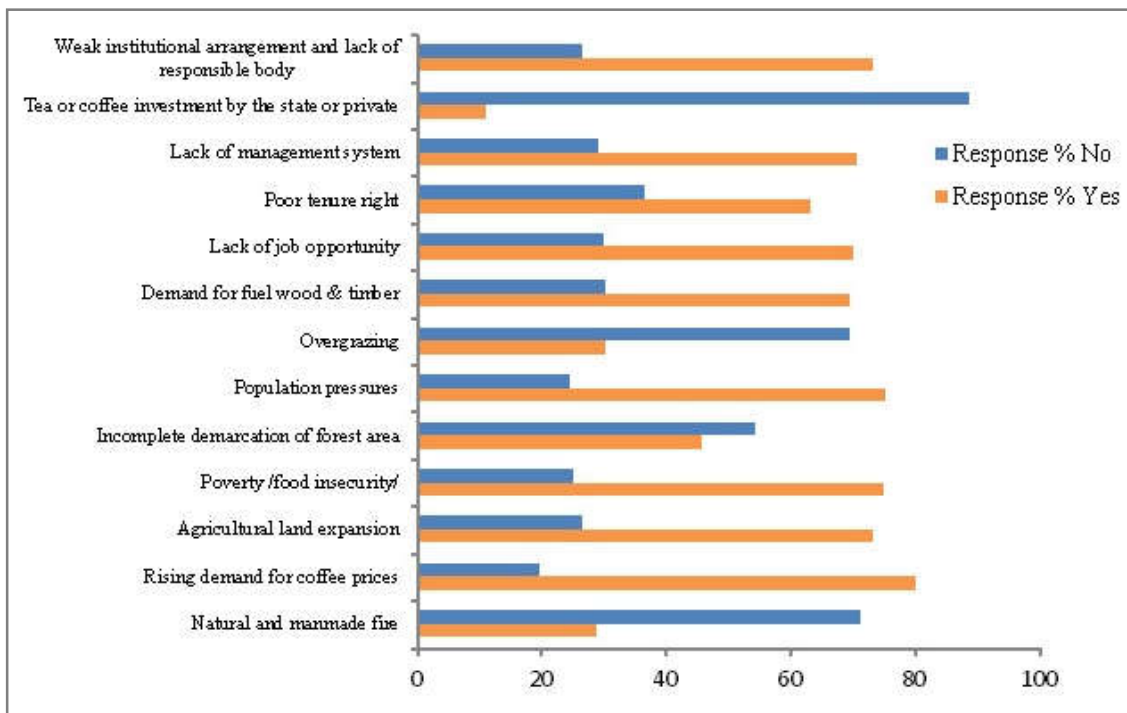


Figure 3.1. Challenges to sustainable forest resource management

natural forest of the areas. Poor management of the natural forests is one of the main reasons for destruction of vegetation cover and loss of genetic diversity of flora and fauna in the study area. According to interview with KI of Gamachisa, onose, Welkitesa, Koti and Kimo kebeles households there were different types of forest resource challenge practice in the study areas. House construction materials some of the house materials used that are made from plants naturally grown in forest. Selling forest products are also other challenges to sustainable forest resource in Nonno Sale Lianas, fuel wood and charcoal are some of the forest products that are sold in the community. Many informants do not remember when people started to sell lianas in the market as it scored many decades. However, they can exactly trace when people started to sell other forest products particularly fuel wood in different phases. Higher demands from the town, lack of subsistence among marginalized groups are identified as the reasons behind charcoal and fuel wood selling.

Livestock production is the other means of subsistence among Nonno Sele woreda people. Rearing of cattle, sheep, goats and pack animals, primarily horse, and donkeys is widely practiced. Some of the grazing areas in forests around the villages are open access to all people who have cattle. Individual farmers usually let their livestock to the field, which does not require shepherding except for occasional supervision. Livestock can stay in the field for a long time without having to keep them in houses or barns except for cows that are milked. There appears to be sharing of habitats between wild animals and livestock in the forest, except with hyenas, which are immediately hunted once seen in the area. It also shows strong mutual trust among the community, and the existence of very strong traditional social organization and control mechanism that enforce compliance to these rules. The ecological knowledge and rules of the community ensures that the size of the livestock population does not put pressure on the open access grazing land. However, a few informants argued that livestock population is increasing in recent days due to changing attitude and value of people favoring to keep

more livestock particularly milk cows, putting pressure on the open access grazing resource and increasing their own economic return.

Table 3.2. Impact of forest resource degradation in Nonno sele woreda

Impacts of forest degradation	Responses (%)	
	Yes	No
soil erosion & soil fertility decline	70	30
Climate change (i.e., rainfall, water variability)	71.6	28.4
Loss of biodiversity (i.e., fauna and flora)	76.1	23.9
fuel wood unavailability	65.8	34.2
Decline of forest product (quality and quantity)	69.1	30.9
Agricultural production decline	84.4	15.6

Source: Feld survey, 2018

The loss of vegetation cover leads to increased surface water runoff causing soil erosion, decline forest productivity, climate change, soil fertility decline, and decline in agricultural productivity. The challenge related to forest ecosystem degradation can be met only if efforts are made to maintain the remaining forests and restore the degraded ones (Demel, 1996). From the field survey and as shown on above table forest degradation resulted in to different problems. The loss of forest cover on the area has resulted in soil erosion & soil fertility decline, climate change (i.e., rainfall, water variability), loss of biodiversity (i.e., fauna and flora, and agricultural production decline which in turn has affected, and still continues to affect human and plant as well as animal welfare.

Opportunity of sustainable forest management in Nonno Sale, woreda: Potential opportunities of sustainable forest management in the study area includes for attractive view for tourists, economic benefit (honey, coffee, cardamom, long pepper, wax production, ecological benefit (biodiversity, soil, water conservation, regulate rainfall, temperature patterns house construction, furniture, utensils, and farm implements and for fencing purposes. The other common non-timber forest products identified were honey, forest coffee, spices, bamboo, fuel wood and charcoal, and others such as palm and wild

fruits. The forests play a central role in the lives of the forest and forest-fringe communities. They provide building materials and firewood which are essential elements of shelter, especially because of the rainfall and the cold in the higher areas. They are also the source of new farm land both for coping with natural population increase and for maintaining crop yields as old fields become less fertile. Even though, this is a benefit that the local people acquired from the forest on the other hand it is a challenges to sustainable forest resource managements in the study areas.

Table 3. Opportunities of sustainable natural forest management

Opportunities	Responses (%)	
	Yes	No
Attractive view for tourists	88.9	11.1
Economic benefit(honey, coffee, cardamom, long pepper, wax production)	88.9	11.1
Ecological benefit(biodiversity, soil, water conservation, regulate rainfall, temperature patterns)	86.8	13.2
Important for carbon sequestration (regulate local and international climate)	89.7	10.3
Important for REDD+ program implementation	89.3	10.7

Source: Feld survey, 2018

The livelihood of the local people largely depends on timber and non-timber forest products. Many of the informants stated the importance of the forest for their livelihood by declaring that it is everything for them. Some equate the forest to a “pension card” passed to them from their parents. A range of values are attached to the forest and non-timber forest products that have socio-economic importance. Honey, wild coffee, climbers and spices are the chief NTFPs they acquire from forest. It was also stated by informants that there were very high people who planted coffee and none spices in the forest. The forest provides climbers and other non-timber construction materials and agricultural tools. The use of large trees is observed only for making traditional beehives. Although honey is a no timber forest product, the use of timber trees for making beehive is an activity that encourages deforestation. Forests are good sources of plants with medicinal values (leaves, barks, roots, fruits, etc.) and hence the linkages between forestry medicine and nutrition are extremely important. Forest provides the only medicines available to a large proportion of Ethiopia's population. Some plants contain high concentrations or particular chemicals that are the base for modern drug equivalents. Secondly, many plants chosen for their traditional medicinal qualities have high concentrations of vitamins and minerals that help counteract illnesses caused by dietary deficiencies. The natural forest in Nonno Salle area is endowed with medicinal plant species to cure different diseases. The society uses many medicinal plants both from the main natural forest near the (kobbo), and near the villages and sometimes from shrubs in the grazing lands for themselves and also their livestock's. Some of the medicinal plants and the disease for which they are used as listed by informants are shown in damakase leaf, andode root. The forests in the South-West Highlands in general and Nonno Sale in particular have of national importance for a variety of economic and ecological reasons, but primarily because of their coffee production. Much of Cardamom and Long Pepper comes from these forests. Honey production from the area suffers from high moisture content, but when this is reduced the honey and wax are of a high quality, being free of any pollutants, and the wax especially fetches a high price when exported. The forests have been a major source of timber in the past but this has declined in importance in recent years. Apart from the

economic benefits, there are a number of important environmental services which the forests provide. The most important of these is the moderation of stream flow in the Baro-Akobo system, with reduced peak flows and enhanced low flows. This reduces the flood damage caused by the rivers and ensures dry season flows.

Climatic stabilization is another benefit from these forests which is difficult to quantify. In particular the forests help to moderate temperatures locally, and through the process of evapo-transpiration, which raises the humidity of the air masses passing over the forests, may increase rainfall, both locally and more widely in the downwind areas - which are mostly the Northern Highlands. Hence, without these forests the north of Ethiopia would probably be drier and more prone to droughts. Globally the importance of the Nono Sele forest resource is primarily in terms of its genetic resources, especially coffee, this being the area where coffee originated, still grows wild, and where it was first domesticated. The area is also important for the carbon sequestration in these forests and the consequent role of the forests in limiting climate change. Hence these forests are important for the REDD+ program in Ethiopia. The densely natural forest, different water falls, caves and HEP generation are the major potential opportunity of natural resource of the study areas. According to field survey report 88.9% replied the natural resource of the areas have ecological benefit (regulating rainfall and temperature, biodiversity conservation and good for soil and water conservation. The biodiversity in the forest in general and forest land areas are also one of the tourist attractive site and also very important for educational research purpose.

Conclusion and policy implications

According to the base line field survey the local communities of the study areas were associated with their owned deep rooted culture of conserving natural ecosystems. According to the study report the best traditional forest resource management practice in an area was named as Kobbo, which implemented in all kebeles of the Woreda. In addition to the indigenous forest resource management practice in the area, there were also contemporary forest resource management practice which are exercise non timber forest production implementation of PFM project. Clearance of forest land has been accelerated in recent decades because of different interest. The major treats to natural forest of the study area were includes rising demand for coffee prices, poverty /food insecurity/, lack of management system, lack of job opportunity, weak institutional arrangement and lack of responsible body. According to field survey and key informant report forest degradation were because of anthropogenic factors. Therefore different conservation mechanism needed to overcome this problem. In an area of this study almost all household survey practiced indigenous forest resource conservation. But not recognized by government. So the government should be recognized and included in the government forest resource conservation plan and also to recognize the complementary roles of communities, private entrepreneurs and the state in forestry development. To encourage all concerned individuals and communities as well as the government to actively involved in the planning and implementation of forestry programs to ensure sustainability, minimize cost, and forestall conflict. Promoting sustainable management and conservation of the existing forests, expanding the forest base by providing incentives for the

people to plant trees, simplifying organizational and administrative structures and procedures, encouraging private sector involvement in forestry matters, participatory approach to forest development through rural organizations (NGO support), integrating forest institutions with public agencies in such field as land use planning, soil and water conservation, rain-fed farming and animal husbandry, and defined property rights. To ensure that afforestation with exotic species be restricted to backyard woodlots, to peri urban plantations and to plantations for specific industrial and other projects; otherwise until reliable information and knowledge on exotic species are available afforestation shall use local species as these are in tune with the environment and thus ensure its well-being, to assist the natural process of afforestation of uncultivable areas by controlling felling and grazing and by planting judiciously selected local species, as well as by other affordable interventions. To adhere to the principle that "sustainable forest management" is achieved when social acceptability and economic viability have been achieved and the volume of wood harvested in a given period is about equal to the net growth that the forest is capable of generating and to pursue agricultural and other policies and programs that will reduce pressure on fragile woodland resources and ecosystems. Practicing PFM project and exercising NTFP and use of alternative energy in the study areas will make suitable ground for sustainable natural forest managements. To promote changes in agricultural and natural resource management systems which will limit the need for free grazing of animals in protected forest areas and to find substitutes for construction and fuel wood whenever capabilities and other conditions allow, in order reducing pressure on forests. Creating public awareness mechanisms by which the local people share information, knowledge, experience, ideas on natural resource conservation, providing education to the farmers through extension service in matters of wildlife and forest conservation. Discouraging the practice of shifting cultivation, this destroys the natural vegetation and wildlife habitats.

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