ISSN: 0975-833X

*Availableonlineathttp://www.journalcra.com*

*International Journal of Current Research*
*Vol. 11, Issue, 06, pp.5056-5062, June, 2019*

**DOI: https://doi.org/10.24941/ijcr.35732.06.2019**

**INTERNATIONAL JOURNAL OFCURRENTRESEARCH**

## RESEARCH ARTICLE

# CONTRIBUTION OF PARTICIPATORY FOREST MANAGEMENT TO FOREST CONSERVATION AND LIVELIHOODS IN NONO SELE WOREDA, SOUTHWEST ETHIOPIA

***Solomon Tadesse and Tekalign Assefa**

Department of Geography and Environmental Studies, Mettu University, Mettu, Ethiopia, P.O. Box 318

**ARTICLE INFO**

*Article History:*
Received 20th March, 2019
Received in revised form
23rd April, 2019
Accepted 26th May, 2019
Published online 30th June, 2019

*Key Words:*

Forest conservation,
Livelihoods, Participatory forest management, Ethiopia

**Corresponding author:*
*Solomon Tadesse*

**ABSTRACT**

The government of Ethiopia has been implemented participatory forest management (PFM) program since 1990s, with twin policy goals of promoting sustainable forest management and improving livelihoods. However, the benefits of this program intervention for forest conservation and livelihoods are not systematically studied and well documented. This study assessed the contribution of PFM program to forest conservation and the livelihoods in Nono sele woreda, southwest of Ethiopia. Data were collected from 241 randomly selected households. A mixed research approach, which integrates household survey, focus group discussions, key informant interviews and field observations were used for this study. Quantitative data were analysed using the Statistical Package for Social Science (SPSS version 23).The findings revealed that improved forest conservation and socio-economic conditions of the local communities were observed after the implementation of PFM in the study area. Expansion of agriculture into forest areas and settlement in the forest has been reduced as reported by vast majority of the respondents 83.4% and 87.1% respectively, while secured right of access to non-timber forest products and household incomes were enhanced as reported by 84.2% and 63.1% of the respondents, respectively. In order to sustain the PFM program, there is a need to provide more tangible economic benefits and alternative income-generating activities to the local communities. Thus, we recommend that Oromia Forest and Wildlife Enterprise and other non-governmental organizations should work on forest and non-forest based livelihood activities.



***Citation: Solomon Tadesse and Tekalign Assefa*, 2019.** "Contribution of participatory forest management to forest conservation and livelihoods in nono sele woreda, southwest Ethiopia", *International Journal of Current Research*, 11, (06), 5056-5062.

## INTRODUCTION

As deforestation and forest degradation persist in many parts of the world, particularly in the tropics, forest management approach has shifted from state-centered control towards community based schemes, with twin goals of promoting sustainable forest management and improving livelihoods (Blomley, 2013). As a result, many African countries (including Ethiopia) have recently adopted participatory forest management (PFM) approach as an alternative to centralized forest management to promote sustainable forest management while improving livelihoods of rural communities (Schreckenberg *et al*., 2006). The underlying premise of PFM is that sustainable forest management is most likely to occur when local communities manage local forests, and when they get access to direct benefits from participating in forest management (Agrawal & Ostrom, 2001). PFM has been described as an agreed arrangement negotiated by government and local communities implemented through fairly divided management functions, benefits and responsibilities over a particular area of forest land to improve management, ensuring regulated access and use according to a jointly developed forest management plan (Tesfaye *et al*., 2015).

In many countries, different terms are used to indicate the involvement of local communities in forest management and different models of PFM have been promoted (Agrawal & Gupta, 2005). These include community forestry, collaborative forest management, participatory forest management, decentralized forest management, community-based forest management and joint forest management all denote a similar process and management arrangement which sometimes differs based on the type of forest ownership, whether it is communal forest or state forest and involves two or more stakeholders and to be associated with particular programs (Webb & Shivakoti, 2007). PFM was first introduced into Ethiopia around the mid-1990s with the assistance of international NGOs as pilot projects (Ameha *et al*., 2014; Bekele *et al*., 2015). The introduction of PFM in Ethiopia was based on the beliefs that: First, centralized and expert dependent forest management practices have been unsuccessful so far and will not succeed in the future. Second, participation of local communities, which are the major stakeholders of forest resources, is the most effective and essential strategy to achieve sustainable forest management and to bring a long lasting solution to deforestation and forest degradation. Third, forests, if properly managed and utilized, offer multiple economic, social and

ecological opportunities to local communities both from goods and services, and are capable of generating sufficient and sustainable livelihoods to take them out of poverty (Gobaze *et al*., 2009; Temesgen & Lemenih, 2012; Ameha *et al*., 2014). It was with this context that PFM in Ethiopia has been implemented with dual policy goals of promoting sustainable forest management and improving the livelihoods of local communities living in and adjacent to forest resources through community participation (Mohammed & Inoue, 2013; Tesfaye *et al*., 2015). Experiences from Ethiopian PFM pilot projects had demonstrated good achievements and apparently other developmental partners joined the initiatives and the geographical coverage of forest areas under PFM has increased considerably across the country (Lemenih *et al*., 2015). Nono Sele PFM scheme is one of such initiatives recently implemented by Ethio-wetland and Natural Resources Association and Oromia Forest and Wildlife Enterprise in southwest parts of Ethiopia.

law enforcement, better relationship between local communities and forest department, and sufficient follow-up by the actors that introduced the scheme. At the same time, there is an expectation that PFM can bring substantial benefits in terms of livelihood security and poverty reduction, as well as providing important indirect benefits to the poor in terms of improved local governance and empowerment (Blomley & Iddi, 2009). Likewise, Schreckenberg *et al*. (2006) also reported positive gains made by PFM in terms of improving livelihood conditions of local communities through access to forest products such as fuel wood, forest coffee, herbal medicine, honey, tree seedlings, thatch grass and fodder, strengthening social capital and improving knowledge and skills of participant households. Similarly, a study by Tesfaye *et al*. (2010) in Ethiopia reported that household incomes were increased following the introduction of PFM in Adaba-Dodola forest. The need to undertake this study steams from inadequate empirical evidence available on the contribution of

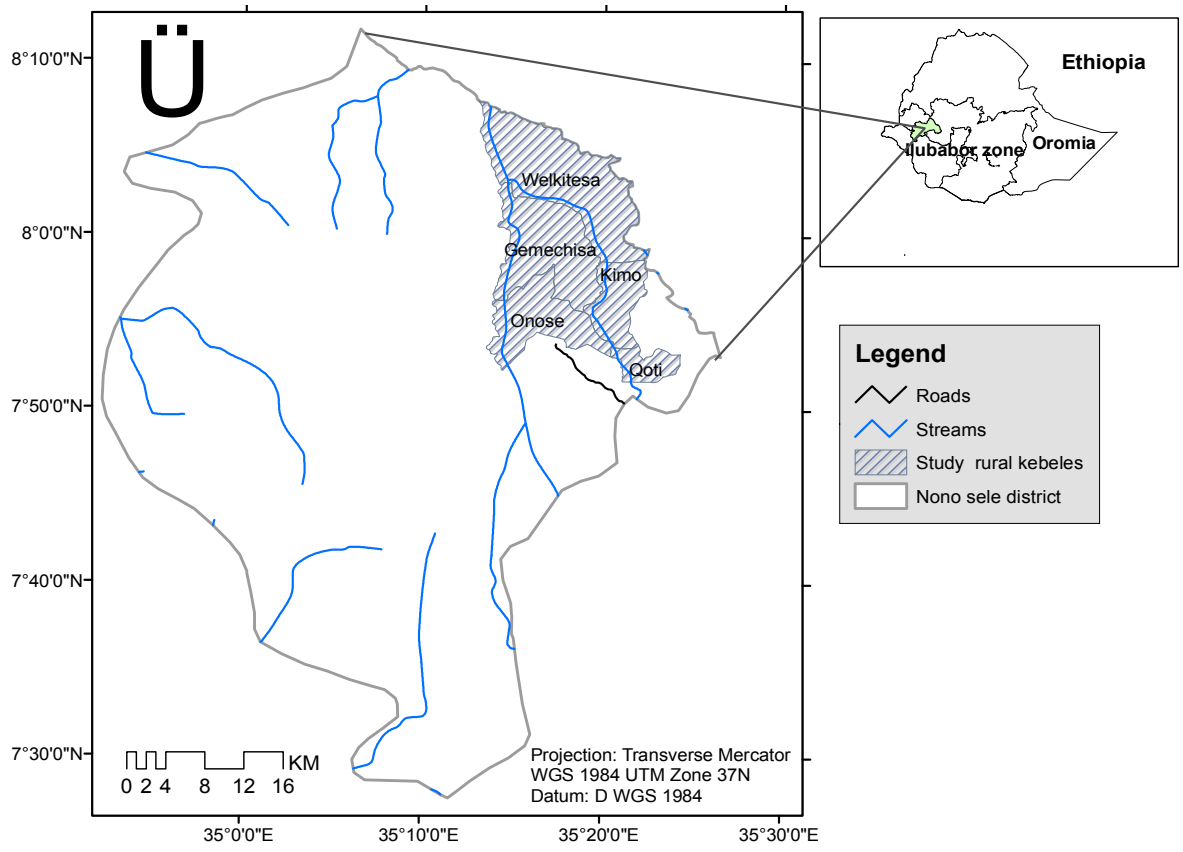


**Figure 1. Map of the study area**

There is a growing international body of literature indicating that PFM can potentially contribute towards achieving improved forest conservation and enhanced rural livelihoods, as long as local communities are recognized as important stakeholders in forest management and encouraged to participate actively (Ameha *et al*., 2016; Tadesse *et al*., 2016).Many studies(e.g. Blomley & Iddi, 2009; Gobeze *et al*., 2009; Takahashi & Todo, 2012; Ameha *et al*., 2016; Tadesse *et al*., 2016;Treue *et al*., 2014)) have demonstrated that PFM is contributing to forest conservation where they have been implemented. According to these studies, the improvement of forest conservation could be attributed to the active involvement of local communities in forest management activities, regulated grazing and extraction of forest products, awareness creation about the forest and its conservation benefits, provisions of capacity buildings trainings, improved

PFM in improving forest conservation and local livelihoods in Nonoseleworeda, Ethiopia. Such evidence-based information would support policy-makersto design appropriate intervention strategies for promoting sustainable forest management and local livelihood improvements. The objectives of this study were therefore to (i) assess the status of PFM program in study area and; (ii) examine the perception of the local communities on the contribution of PFM to the forest conservation and livelihoods. The results of this study will contributes to the growing PFM literature by providing important information for policy-makers and PFM implementers that help to make informed decisions in formulating and developing appropriate forest conservation and livelihood improvements strategies in the area and also contribute to the Ethiopian government's development of a national PFM scaling up program.

## MATERIALS AND METHODS

**Study area:** The study was conducted in Nono sele woreda (woreda in Amharic), located in Ilaubabor administrative zone of Oromia National Regional State, Southwest Ethiopia (Figure.1), where PFM has been actively implemented. Astronomically it lies between 7° 27'-8°18' N latitude and 34°52'-35°26' E longitude. The altitude of the study area rises 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. The main part of the district (90% of the land area) belongs to the *woina-dega* (subtropical) ranges from 1500 to 2300 m asl) traditional agro-climatic zone, with the remaining area belonging to the *kolla* agro-climatic zone (500–1500 m asl). As projected from population data (CSA, 2013), 27,616 people inhabit the district, of which 49.9% are male and 51.1% are female. The district generally experiences humid climatic conditions. The rainfall distribution is unimodal, with the highest rainfall between Junes to September. Rain falls throughout the year. Reliable climatic data of the area is not available due to lack of weather station for many years. Based on the information from nearby station such as Gore, the mean annual rainfall is estimated to be well over 2100mm. The mean annual maximum and minimum temperature are estimated to be 11°Cand 18°C, respectively. Based on the FAO (1990) soil classification system, dystric nitisols (red-basaltic soil) dominated the study area whilst considerable proportion of dystric gleysols, orthic acrisol and orthic solonchaks are also present. The natural vegetation in the study area is predominantly Afromontane rainforest and dominated by *Albiziagummifera*, *Millittia ferruginea, Pouteriaadolfi-friederici*, *Schafferabyssinica* and *Sapimellipticum* (Tadesse *et al*., 2016). Agriculture is the main economic activity and source of livelihood in the study area. The farming system is mixed crop-livestock production on a subsistence level. The study area has high potential in cereal production due to its favorable agro-climatic conditions and the main crops cultivated in the area are maize (*Zea mays*) and sorghum (*Sorghum bicolor*) mainly for consumption purposes. Harvesting of non-timber forest products (NTFPs) such as forest coffee, honey and spices also occupy an important place in the household economy. Spices such as *Aframomum corrorima* and *Piper capense* are collected from naturally growing plants.

**Background of Nono Sele PFM program**

The PFM project was implemented in the Nono Sele forest from 2010-2014 by Oromia Forest and Wildlife Enterprise (OFWE) with financial support from European Union. The project encompasses seven rural kebeles and eight cooperatives through active participations of local communities. The goals of the project include promoting of sustainable forest management through implementation of PFM and improvement of the livelihood of forest dependent communities through providing forest based and non-forest based livelihood activities. Before the conservation intervention, the forest was one of the 58 National Forest Priority Areas and the management of forests was the full responsibility of the government and much of the attention was given on protecting the forest. Ethio-wetland and natural resources associationwith financial support from Norwegian Agency for Development(NORAD) through the Development Fund of Norway in collaboration with OFWE was implemented PFM program in the Nono Sele forest from 2013-2015. This projectconsists twelve rural kebeles and twelve cooperatives. The overall objective of the project to establish PFM and contributes to increasing carbon storage in Nono-sele forest. So far, a total of 19 PFM rural kebeles, 45 forest user (FUGs) and 20 cooperatives have been formed under both projects.Based on the data obtained from district forest enterprise office, a total of 130,026.1 ha of forests were handed-over to 45 formally registered FUGs, involving nearly 9,268 beneficiaries as of December 2018. Under PFM arrangement communities were to assume forest management responsibility, extract benefits from it with more organized and sustainable basis, and win rights they have lost for long. It is about building the technical and managerial capabilities of communities to support their livelihoods from forests, build their self-confidence, and also ensure the sustainable use of the resource-based under community control through enduring institutions. Currently, the REDD+ initiative has been implemented by Ethio-wetland and natural resources association with financial support from Norwegian Agency for Development at all PFM rural kebele in the district.

**Sampling procedure:** A two stage sampling procedure with a combination of purposive (to select sample district) and random sampling (to select sample PFM rural kebeles and household heads).In the first stage, Nono sele woreda among the districts of the Ilubabor zone was purposive selected for the study due to PFM has been practiced in the forest for a numbers of years. In the second stage, five PFM rural kebeles, namely, Gemechisa, Welkitesa, Kimo, Qoti and Onosewere also purposively selected out of the total 19 PFM rural kebeles that were included under PFM program in relation to accessibility of transportation and different community development activities were carried out by the project. In the third stage, sample size was determined through probability proportional to size sampling techniqueas recommended by Kumar (1999). For household survey, atotal of241 household heads (from all sampled PFM rural kebeles), which was 10% of total households in each kebele) were sampled based on a random sampling procedure sample, with FUGs registers used as sampling frames.

**Data collection:** Data were collected from primary and secondary sources. Primary data were collected through a household questionnaire survey, key informant interview and focus group discussions between October and November 2018. Secondary data was gathered from various government offices both at district and zone, available NGO reports and published and unpublished articles. The study cannot rely on time series (before and after PFM) because of the lack of base line data collected for before PFM. Thus, a longitudinal survey research design was employed to collect necessary information related to the contribution of PFM to forest conservation and livelihoods. Prior to the actual survey, visits were made to concerned offices and secondary information relevant to the study was gathered from all possible sources. The questionnaires were divided into two sections. The first section consisted 12 forest conditions improvement local indicators that identified through literature review and consultation with forest experts. These indicators were rated on a three point continuum with 1= increased 2= decreased and 3= not changed. The second part contained 12items intended to assess perceptions of local communities on the contribution of PFM tolivelihoods based on a five point likert scale rating which

ranged from strongly agree to strongly disagree. The questionnaires were administered to the sampled household heads with the assistance of trained enumerators. The research assistants were recruited from the respective sample kebeles on the basis of their educational background, ability to communicate local language (Afaan Oromo), familiarity with the area and previous experience in data collection. Enumerators were trained on data collection procedures, interviewing techniques and the detailed contents of the questionnaire. In addition to the quantitative household survey, key informant interviews and focus group discussions were conducted to obtain qualitative information. To obtain accurate information, the focus group discussions were held with a few knowledgeable FUG members and forest management committees who could provide reliable information. Accordingly, a total of three focus group discussions, each with seven participants, were undertaken in each of the three PFM rural kebele administrative offices. Major points raised for discussion included several issues regarding the contribution of PFM program to forest status and socio-economic condition of the local communities. In-depth interviews were held with a total of 23 key informants, mainly selected from the FUG members, FUG leaders, forest managers, and forest experts. These respondents provided information on the role of PFM in improving forest status and local livelihoods. Purposive sampling was employed to select participants of the focus group discussions and key informant interviews. The rationale for using a purposive sampling technique was to ensure that the selected participants had an extensive knowledge of the research topic/issues and those both male and female members were represented. Finally, field observation was carried out as a supporting data collection approach, to observe the major forest products collected from the forest and bee hives and honey products of the forest. This was done at the nearby forests in each of the three sample kebeles.

**Data analysis:** Data analysis involved both quantitative and qualitative techniques. Quantitative data, mainly obtained through household survey questionnaires, were analyzed using the statistical package for social sciences (SPSS) version 23 for descriptive statistics such as mean, percentages, frequencies and standard deviations. Qualitative data generated through key informant interviews and focus group discussions were used to augment and substantiate the quantitative analysis.

## RESULTS AND DISCUSSION

**Contribution of PFM to forest conservation:** The perceptions of the local community on the contribution of PFM to sustainable forest conservation and management were assessed using eleven local indicators (Table 3.1). The findings from the household survey revealed that the majority of respondents (59.3%) reported that reforestation of degraded forest areas were increased following the implementation of the PFM program in the study area. This could attribute due to PFM program created environmental awareness to rehabilitate the degraded forest area. During focus group discussion, all participants mentioned that PFM encouraged all of its participants to plant trees on degraded forest areas through collecting naturally grown seedlings from the natural forest.

Findings further showed that(83.4%) of the respondents were responded that expansion of agriculture into forest area was decreased after the PFM implementation. According to discussions with forest experts and key informants agricultural land expansion is the most important direct driver of deforestation and forest degradation in Nono Sele forest before PFM implementation. However, following the establishment of the program the encroachment into forest areas were prohibited due the demarcation and mapping of natural forest boundaries as forest blocks and PFM restricts further expansion of farmlands into the forest boundaries. Regarding firewood collection for selling, cutting tress for timber production and charcoal making for commercial more than half of the respondents responded that there were significant reductionsafter PFM implementation in the area (Table 3.1). This suggesting that forest areas that are managed by or together with rural communities are likely to have lower levels of forest disturbance. In addition, a significant number of respondents (87.1 %,) indicated that settlement in the forest area was reduced after the establishment of PFM program. This result is supported by key informants, who often stated that settlement in the forest was reduced after PFM implementation in the area. Majority of the respondents (89.6%) also reported that the establishment of the PFM has reduced the incidences of forest fire inside the forest. Regarding overgrazing in the forest, most of the respondents (56%) responded that overgrazing in the forest was decreased following the establishment of the program.More than half of the respondents (60.6%) responded that over extraction of forest products was decreased after PFM implementation. According to focus group discussions, PFM program, especially those which emanate from conservation initiatives, allow the gathering for home consumption of forest products, but not allow local people to market products from protected forests. As shown in Table 3.1, it appeared that a large proportion of the respondents (82.6%) responded that forest regeneration status was increased after the PFM implementation. This result is supported by focus group discussants, as they mentioned natural regeneration of indigenous plants and healthy seedlings were increased in the forest following the establishment of the PFM program.As reported by focus group discussion participants and key informants, the improvement of forest conditions could be attributed to the active involvement of local communities in forest management activities, regulated grazing and extraction of forest products, awareness creation about the forest and its conservation benefits, provisions of capacity buildings trainings, improved law enforcement, better relationship between local communities and forest department, and sufficient follow-up by the actors that introduced the scheme.

**Contribution of PFM to livelihoods:** In order to explore the community's perceptions on the contribution of PFM program to livelihoods, the respondents were asked several questions as stated in (Table 3.2). It was found that 84.2% of the respondents were agreed with the statements that said PFM secured right of access to non-timber forest products (NTFPs) while 7.9% of the respondents were not. This result is supported the key informants, as they stated communities have gained control and use rights over the forest after PFM implementation. Furthermore, district forest officer mentioned that the main principle of the PFM approach is granting exclusive user rights to the recognized members of forest users in the state-owned forest. As Blomley & Iddi (2009) noted one objective of the PFM is to improve the livelihoods of rural communities who live in and around the forests through providing legal access rights to forest resources and benefits associated with forest management. This finding matches the

results of Blomley & Iddi, (2009) who reported that experience from various countries has shown that the collaborative management approaches yielded positive benefits that may contribute to an improvement of local people livelihood.

mention that most of the respondents (78.8%) agreed with the statement that PFM reduced conflicts over forest resource uses. This implies that participatory approaches can have a great contribution in preventing and solving or alleviating conflicts

**Table 1. Perceptions of the local community on the contribution of PFM to forest conservation**

| Indicators | Observed change (%) | | |
|---|---|---|---|
| | Increased | Decreased | Not changed |
| Reforestation of degraded forest areas | 59.3 | 8.7 | 32 |
| Expansion of agriculture into forest area | 9.5 | 83.4 | 7.1 |
| Firewood collection for selling | 22.8 | 61.8 | 15.4 |
| Cutting tress for timber production | 19.1 | 68 | 12.9 |
| Charcoal making for commercial | 16.6 | 74.7 | 8.7 |
| Settlement in the forest | 5.4 | 87.1 | 7.5 |
| Incidences of forest fire | 3.8 | 89.6 | 6.6 |
| Over extraction of forest products | 28.2 | 60.6 | 11.2 |
| Overgrazing in the forest | 29.5 | 56 | 14.5 |
| Forest regeneration status | 82.6 | 4.1 | 13.3 |
| Density of forest cover | 81.3 | 2.5 | 16.2 |

Source: Field survey, 2018

**Respondents' responses towards the contributions of PFM program to livelihoods**

| Statements | Level of agreement (%) | | | Mean |
|---|---|---|---|---|
| | Disagree | Neutral | Agree | |
| PFM secured right of access to non-timber forest products (NTFPs) | 7.9 | 13.3 | 84.2 | 3.92 |
| PFM generated household income (specifically, income from NTFP) | 20.4 | 16.5 | 63.1 | 3.49 |
| PFM created employment opportunities for the local community | 72.2 | 10.4 | 17.5 | 2.28 |
| PFM promoted income generating activities | 41.5 | 12.4 | 46.1 | 3.00 |
| PFM created market linkages for the participants | 8.3 | 4.6 | 87.1 | 3.97 |
| PFM improved sense of ownership over the forest | 10.7 | 12.9 | 76.3 | 3.84 |
| PFM has reduced conflict over the forest resource use | 8.3 | 12.9 | 78.8 | 3.88 |
| PFM improved the relationship and trust between local community and forest department | 8.7 | 11.2 | 80 | 3.90 |
| PFM empowered women and marginalized groups in forest decision- making process | 17.4 | 8.7 | 73.9 | 3.79 |
| PFM raised environmental awareness for the local community | 7.9 | 10.8 | 81.3 | 3.94 |
| PFM provided various capacity building trainings for participants | 7 | 9.5 | 83.4 | 3.95 |
| PFM supported the implementation of REDD+ in the forest | 6.2 | 10.4 | 83.4 | 4.00 |

Note: Disagree (strongly disagree +disagree), Neutral, Agree (strongly agree + agree): a higher mean value indicates greater level of agreement with the statement

As shown in Table 3.2, more than half of the respondents (63.1%) agreed that PFM generated household income specifically, from non-timber forest products. According to focus group discussions, there are a number of non-timber forest products such as forest coffee, honey, spice, fodder and medicinal plants extracted freely from the forest. For example, during personal observation, a beehive was noted in almost every forest. The result is further supported by key informants, as they often mentioned that households engagement in honey production from hives hanged in a forest has been widely practiced. As one participant said; 'honey from the forest is harvested three to five times annually from the forest'. Economic incentives are one of the characteristics of community forestry because communities who participate in community forest management may receive benefits such as forest products, non-timber forest products, cash income and employment opportunities (Ameha *et al*., 2014). The important finding in the current study was that the Nono sele natural forests have the potential to provide honey for household and income from honey contributed a significant proportion of the annual forest income of households. This implies that beekeeping as an environmentally friendly income generating activity that should be promoted in participatory forest management. A majority of the respondents (76.3%) agreed with the statement that PFM improved a sense of ownership over the forest resources. This result was further supported by the focus group discussions, as they mentioned prior to PFM implementation they worried about losing the forest in the future as many forest areas were given to various investors for coffee and tea plantation development. It is important to over the use of forest uses. According to district forest officer, by informing stakeholders from the very beginning about the forest management process (e.g. its stages, its aims and results), a common and correct understanding is developed and misunderstanding, misinterpreting are avoided. Interestingly, considerable proportion of the respondents (80%) agreed that PFM improved the level of relationship and trust between forest users and the forest department. Focus group discussion and key informants responded that with the inception of PFM, there was a change in the relationship and attitudes of local communities towards forest department. In contrast, a majority of them (72.2%) expressed their disagreement with employment opportunities created for local communities organized under the program. The findings from the household survey also revealed that less than half of the respondents (46.1%) agreed with the statement that said PFM promoted income generating activities for the participants. Similarly, majority of the respondents (73.9%) fully agreed that PFM empowered women and marginalized groups in forest decision-making process (Table 3.2). According to information obtained from district forest and wildlife enterprise office, PFM emphasized the need for community participation and empowerment in the management of natural resources in order to achieve sustainable forest management and livelihoods. According to him, forest management committees were comprised female-headed households and minorities groups. This suggests that PFM is not only about benefit sharing, but also about empowerment and decision-making on issues that immediately and vitally concern communities. PFM deals with community participation as they are gaining a new role as

forest managers and legal users, and need to be organized, establish appropriate institutions, define their needs, develop plans and implement the plans to achieve a successful forest management and meet their needs. A large proportion of the respondents (81.3%) agreed with the statement that said the PFM increased environmental awareness for the participants organized under the program on the benefits associated with the project and sustainable forest management and conservation in the area and beyond. Access to market opportunities specifically for forest coffee, was also supported by a substantial proportion (87.1%) of the respondents. This result was further supported by focus group discussants that stated PFM played a significant role in facilitating access to markets through creating linkages with the Oromia Coffee Farmers Cooperatives Union. According to focus group participants and key informants, this access to marketing opportunities helped to empower the participants in terms of providing access to price information about the quality of forest coffee. Similarly, key informants reported that prior to joining the PFM program, participants sold their coffee exclusively to local traders with low price at coffee harvesting time, but after PFM implementation they sold with better price due to marketing chain created by the program. Furthermore, as we could observe during fieldwork a warehouse and a cemented floor for coffee storage and processing had been constructed for PFM participants with financial assistance of the project.

The survey result also revealed that (83.4%) of the respondents were fullyagreed that PFM provided various capacity building trainings for participants. According to focus group discussants, the project had provided a number of capacity building trainings on coffee and honey harvesting and processes. They also mentioned that capacity building trainings on coffee Forest Coffee Certification Program (FCCP) were given by Japan international and cooperation Agency. The JICA also identified this forest coffee as one of the most economically important products to be promoted through its FCCP. According to district forest officer, forest coffee was one of the commodities that the community living in and nearby Nono sele forest has been gathering and generating considerable income. Similarly, majority of the respondents (83.4%) agreed that PFM provided immediate opportunities for establishing pilot projects for reducing Emissions from Deforestation and Degradation (REDD+) in the forest (Table 3.2). This finding supported by the focus group discussants and key informants, they stated that currently, the REDD+ initiative has been implemented by Ethio-wetland and natural resources association with financial support from Norwegian Agency for Development at all PFM rural kebele in the district, which will increase the likelihood of household incomes by granting communities more options.

**Conclusion and policy implications**

The study examined the contribution of participatory forest management to forest conservation and livelihoods in Nono sele woreda, Southwest of Ethiopia. Overall, the survey results have indicated that there are substantial improvements in forest conditions through healthy regeneration of the natural forest and reduced forest disturbance and the socio-economic benefits of forest dependent community from the forests. This result supports the findings in the literature that PFM pursues two goals at the same time; to conserve the forest and to improve the well-being of the people living in the forest. To sustain the current positive contributions of PFMprogram, the forest department should promote more alternative income-generating activities such as ecotourism, beekeeping and other environmentally-friendly activities for better forest conservation and livelihood improvements in the area. The project should expanded livelihood options for the local people, helped reduce people's reliance on forest resources and maximized their income earned from non-timber forest products. Modern beehives should be provided to the community. Besides, improved market opportunities for non-timber forest products such as honey and spices as well as employment opportunities for the participant households should be promoted. Forest coffee certification program and establishing apiculture should be promoted in the study area. Further research is needed to examine level of community participation in PFM implementation and challenges related to long-term sustainability of the PFM program.

**Acknowledgements**

The financial support obtained from the MELCA-Ethiopia for conducting this research is gratefully acknowledged. We would like to express our thanks to Illubabor Zone Forest and Wildlife Enterprise for their permission to carry out the research on the forest, forest experts, enumerators and sampled households for their kind cooperation during field data collection.

## REFERENCES

Agrawal, A and Gupta. K. 2005. Decentralization and participation: The governance of common pool resources in Nepal's Terai. World Development 33:1101-1114

Agrawal, A. and Ostrom, E. 2001. Collective action, property rights, and decentralization in resource use in India and Nepal. Politics and Society, 29, 485–514.

Ameha, A., Nielsen, O. and Larsen, H. 2014. Impacts of access and benefit sharing on livelihoods and forest: Case of participatory forest management in Ethiopia. Ecological Economics, 97, 162–171.

Ameha,A., Meilby, H. and Feyisa, G.L. 2016. Impacts of participatory forest management on species composition and forest structure in Ethiopia, International Journal of Biodiversity Science, Ecosystem Services & Management, 12, 139–153.

Bekele, M., Tesfaye, Y., Mohammed, Z., Zewdie, S., Tebikew, Y., Brockhaus, M., &Kassa, H. 2015. The context of REDD+ in Ethiopia: Drivers, agents and institutions. Occasional Paper 127. Bogor, Indonesia: CIFOR.

Blomley, T. 2013. Lessons Learned from Community Forestry in Africa and Their Relevance for REDD+. USAID-supported Forest Carbon, Markets and Communities (FCMC) Program. Washington, DC, USA.

Blomley, T. and Iddi, S. 2009. Participatory Forest Management in Tanzania: 1993–2009 Lessons learned and experiences to date. Dodoma, Tanzania: Ministry of Natural Resources and Tourism.

CSA [Central Statistical Agency of Ethiopia] 2013. In: Population Projection of Ethiopia for All Regions at Woreda Level from 2014–2017. Addis Ababa, Ethiopia

FAO [Food and Agriculture Organization of United Nations] 1990. The conservation and rehabilitation of African lands; towards sustainableagriculture. Rome, Italy: FAO.

Gobeze, T., Bekele, M., Lemenih, M. and Kassa, H. 2009. Participatory forest management and its impacts on

livelihoods and forest status: the case of Bonga forest in Ethiopia. *International Forestry Review*, 11, 346–358.

Kumar R. 1999. Research methodology: a step-by-step guide for beginners. London: Sage.

Lemenih, M., Allan, C. and Biot, Y. 2015. Making forest conservation benefit local communities: Participatory Forest Management in Ethiopia.

Mohammed, A.J. and Inoue, M. 2013. Exploring decentralized forest management in Ethiopia using actor-power-accountability framework: case study in West Shoa zone. Environment, *Development and Sustainability*, 15, 807–825.

Schreckenberg, K., Luttrell, C. and Moss, C. 2006. Participatory Forest Management: an overview: Forest Policy and Environment Programme: Grey Literature March 2006 ODI UK.

Tadesse S, Woldetsadik M, Senbeta F. 2016. Impacts of participatory forest management on forest conditions: evidences from Gebradima Forest, southwest Ethiopia. *J Sustain For* 35:604–622

Takahashi, R., &Todo, Y. 2012. Impact of community-based forest management on forest protection: evidence from an aid-funded project in Ethiopia. Environmental Management, 50, 396–404.

Temesgen, Z., &Lemenih, M. 2012. Guideline for Participatory Forest Management in Ethiopia. Ministry of Agriculture, Addis Ababa, Ethiopia.

Tesfaye, Y., Bekele, M., Kebede, H., Tefera, F., &Kassa, H. 2015. Enhancing the Role of Forestry in Building Climate Resilient Green Economy in Ethiopia: Strategy for scaling up effective forest management practices in Oromia National Regional State with emphasis on participatory forest management. *Center for International Forestry Research, Addis Ababa, Ethiopia*

Tesfaye, Y., Roos, A., Campbell, B.M. and Bohlin, F. 2010. Forest incomes and poverty alleviation under participatory forest management in the Bale Highlands, Southern Ethiopia. International Forestry Review, 12, 66–77.

Treue,T.,Ngaga,Y.M., Meilby, H., Lund, J.F.,Kajembe,G., Iddi, S., Blomley, T.,Theilade, I.,Chamshama, S.A.,Skeie, K.,Njana, M.A.,Ngowi, S.E.,Isango, J.A.,& Burgess, N.D. 2014. Does participatory forest management promote sustainable forest utilization in Tanzania? International Forestry Review, 16, 23–38.

Webb, E and Shivakoti, G. 2007. (Eds.). In press. Decentralization, Forests and Rural Communities: policy outcomes in South and Southeast Asia. Sage Press, India

*******