

# Role of Participatory Forest Management in Livelihood Diversification in the Case of Jello Forest, West Hararghe, Ethiopia

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## Abstract

Empowering local community as a developer of forest resource rather than considering them as a threat to the resource is one of the underlying aim of the Participatory Forest Management (PFM). The objectives of this study were to assess the role of PFM in livelihood diversification and people's attitude towards livelihood diversification. Data were collected from 172 respondents through interviewing and also focus group discussion with different groups and as well as from secondary documents. Statistical tests were applied to see the relation between the variables. Accordingly, Wilcoxon signed-rank test was used to compare the means of change in livelihood diversification and improvement before and after the implementation of the project. The results showed that there was a significant livelihood diversification as well as livelihood improvement for the beneficiaries. In general it can be inferred that, the establishment of PFM diversifies and improve livelihood activities of participant households and also that peoples are positive towards PFM and the changes in their livelihood as the result of PFM.

**Keywords:** Participatory Forest management, Livelihood Diversification and Jello Forest

## 1. Introduction

Forest provides extraordinarily vast and far-reaching contribution to the well-being of humankind. It play a fundamental role in combating rural poverty, ensuring food security and providing decent livelihoods; they offer promising midterm green growth opportunities; and they deliver vital long term environmental services, such as clean air and water, conservation of biodiversity and mitigation of climate change (1). However, the unwise intervention resulted in the continuous loss of forest cover area in many parts of the world (2). In accounts of the increasing human and livestock population, the demand for forest products and forest land for the expansion of farm and grazing lands has increased overtime particularly in Ethiopia (3). In addition, because of uncontrolled human and livestock intervention over the past, the forest resource of the area degraded to the worst degree. On the other hand the ineffective forest management efforts over the past (4), which mainly focused on prohibitive rules and deny access rights of the local people (5,6) have resulted in over exploitation of forest resources in the country. There has been no effort to integrate social, economic, and environmental concern in to the conventional conservation strategy rather the punitive legal approach remained as the only means (7). This situation let the forests remain without an owner; create a property right regime closer to open access that could lead to illegal activities (8). As an alternative means to deal with the shortcoming of the approach, in which government plays the central role, the participatory forest management approach emerged, in which local communities play central role (9, 10). The central premise in PFM approach is that, local communities who live in close proximity to a forest possess an inherent capacity to govern their resources properly (11) and degree of threat to the forest due to externally managed and commercial value of the forest (9). PFM approach emphasizes the importance of alternative livelihood intervention as one of the means to reduce forest dependency through poverty reduction. According to (12), diversification contributes positively to livelihood sustainability because it reduces proneness to stress and shocks. Thus alternative livelihood intervention is an important component in the PFM arrangement. The social benefits of a successful PFM implementation is not limited to revenue sharing, but also the building of an effective and just local governance as well as democratization, because through the process of introduction and implementation, the relationships between several stakeholders may improve as they have to agree on common outputs (9). As parts of its effort to maintain and conserve the forest resource for long lasting use in the Oromia region, Oromia Forest and Wildlife Enterprise came to start PFM project in 2009, at Jello forest district, located in Chiro and Gemechis *woredas* (13). The areas under Jello PFM have been characterized by food insecurity and a fragile environment composed of open forests, ruminants of old tree and rehabilitating forests before the establishment of PFM. Up to date there is no study conducted on the topic of interest at the site and hence become the base for this study. Therefore, this research tried to assess the role of PFM in livelihood diversification and the people's perception towards livelihood diversification due to the project.

## 2. Materials and Methods

### 2.1 Description of the Study Area

The study was conducted on Jello Forest which is situated in Jello-Muktar State Forest Priority Area at about 332kms southeast of Addis Ababa. Geographically located at 8<sup>0</sup>55'N latitude and 40<sup>0</sup>50'E-40<sup>0</sup>51'E longitude. The forest shares boundaries in North and East with Chiro *Woreda*, in the South-east with Gemechis *woreda* and in the west with Oda Bultum *woreda*. The forest in the study is mainly characterised by dry afro-montain forest; and covering an area of around 7820 ha. Some of the characteristic tree and shrub species include: *Podocarpus falcatus*, *Juniperus excels*, *Vernonia spp.*, *Rosa abyssinica*, *Bersema abyssinica*, *Dodonaea augustifolia*, *Haginia abyssinica* and others (13).

### 2.2 Sampling Method

Jello forest is selected as the study area on the bases of its ecological and socio-economic importance and also because it is one of the forests priority areas in the western Hararge Zone where PFM was first implemented. There is also lack of information regarding PFM impact since its establishment in 2009. Jello forest has two forest districts (Gemechis and Chiro) and three *kebeles* (Sororo, Maderia and Chiro-kella) with nine PFM blocks in total. In order to carry out the study one kebele with three PFM blocks was randomly selected using lottery mechanism. Accordingly Sororo kebele was selected for the study.

Sample size was determined by using (16) sample size determination formula:

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

Where n stands for sample size, N for total households (HHs) and e represent level of precision. With 90% confidence level and an error limit of 10%. Accordingly, 86 PFM member households were selected randomly from the three PFM blocks proportional to size of the population of the kebeles (Chefe, Wesene and Gende-dara). Accordingly 35, 22 and 29 households are selected from Chefe, Gende-dara and Wesene PFM groups (blocks) respectively.

### 2.3 Methods of Data Collection

For this research purpose, both primary and secondary data were used. Primary data was collected through key informant interview, focus group discussion and household survey. The questionnaire for household survey was pre-tested to check whether it is easy to be understood by the respondents and capable of collecting the required data. It composed of both closed and open ended question. The source of secondary data include published and unpublished material references such as: books, journals, project reports and maps.

### 2.4 Methods of Data Analysis

Data collected through key informant interview and focus group discussion were analysed using content analyses discourse analysis methods. Accordingly, relevant themes and concepts were identified and summarized. On the other hand, the household survey data were analysed using descriptive statistics and then presented using tables, bar graphs and box plots. In order to compare livelihood diversification before PFM and after PFM non-parametric test for paired samples, Wilcoxon signed-rank test was used to compare the means of two paired samples. The same test was also used to compare livelihood improvements before and after PFM. Supporting tool for the analyses was R statistical software.

## 3. Results

### 3.1 Effects of PFM on Livelihood Diversification

The term livelihood diversification is used to denote the diversity of activities and choices that people make in order to achieve their livelihood objectives (including productive activities, investment strategies, reproductive choices, etc.). The figure below depicts the livelihood activities of households before and after participating in the project.

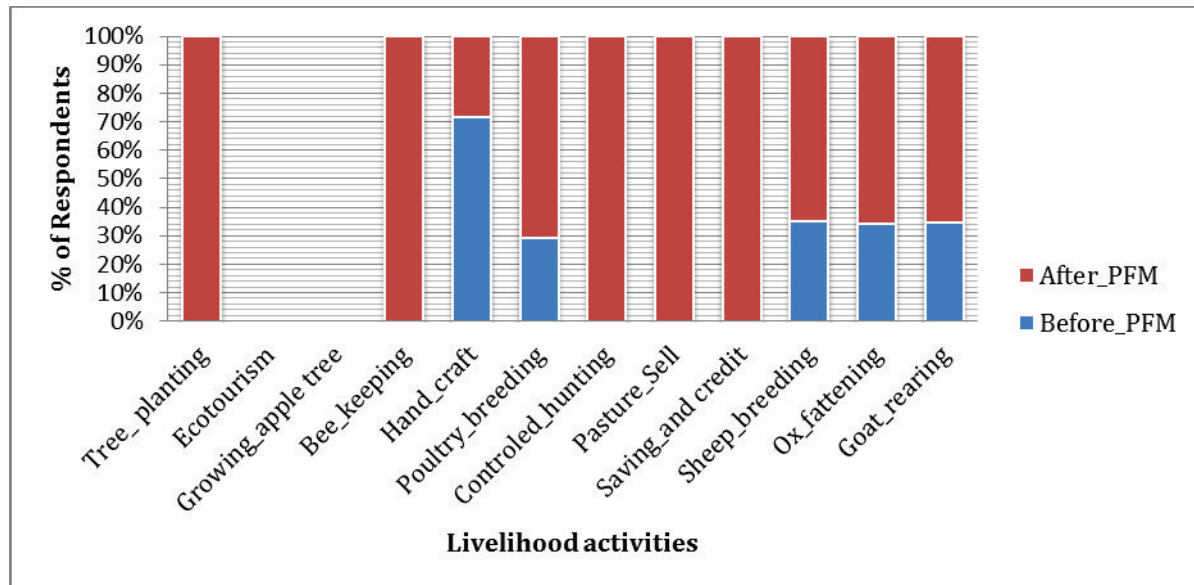


Figure 3.1: Diversification of livelihood activities for PFM households

As it is clearly depicted in (Figure 3.1), after the establishment of PFM, participant household’s livelihood activities has been increased. The participants were engaged in livelihood activities such as tree planting, bee keeping, controlled hunting and pasture sell and also had more access to services such as saving and credit after they engaged in the PFM. Similarly, livelihood activities that PFM members already undertook before the establishment of PFM such as, Poultry breeding, Sheep breeding, Ox fattening also increased. For instance, before the establishment of PFM, 27% of the respondents reported to have been engaged in poultry breeding and 66% of the respondents reported that they participated in poultry breeding after PFM has established. In case of sheep breeding 34% of respondents reported that they have been engaged in sheep breeding and after PFM was established 63% of the respondents reported the same. Furthermore, ox fattening were also reported 34% before PFM and 66% after PFM establishment. The result for goat rearing also indicates 35% before PFM and 66% after PFM establishment. The box plot of livelihood diversification score (sum of different livelihood activities) for before and after PFM establishment looks like the following.

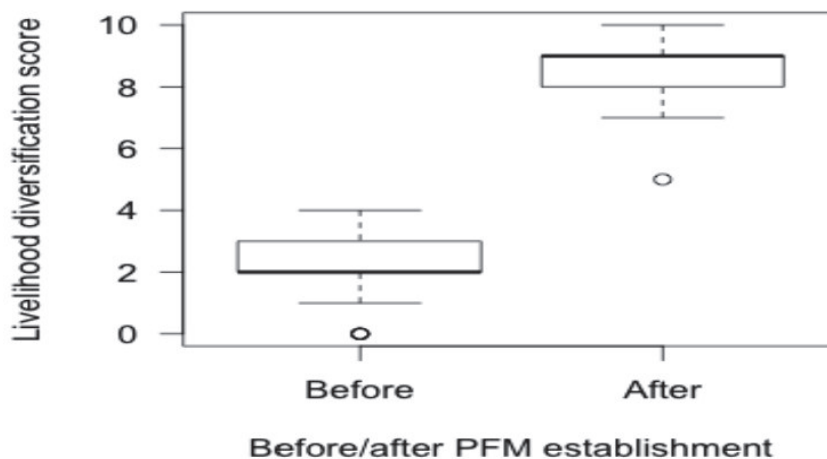


Figure 3.2: Box plot for livelihood diversification score

The result for statistical test (Wilcoxon signed rank test) of livelihood diversification score before PFM and after PFM establishment found to be significant with p-value = 5.095e-16. According to Wilcoxon signed rank test, membership in PFM has significant effect on livelihood diversification.

### 3.2 Effects of PFM on Livelihood Improvement

The introduction of PFM was expected to achieve the dual goal of contributing to the sustainable management of the forest resources and the improvement of the socioeconomic status of the local community (Tsegaye Gobeze et al, 2009). In this study, the respondents were interviewed whether there is an improvement in their livelihood after they come to the membership of the project on some of the indicators and the results were summarized in

the figure 3.3 below:

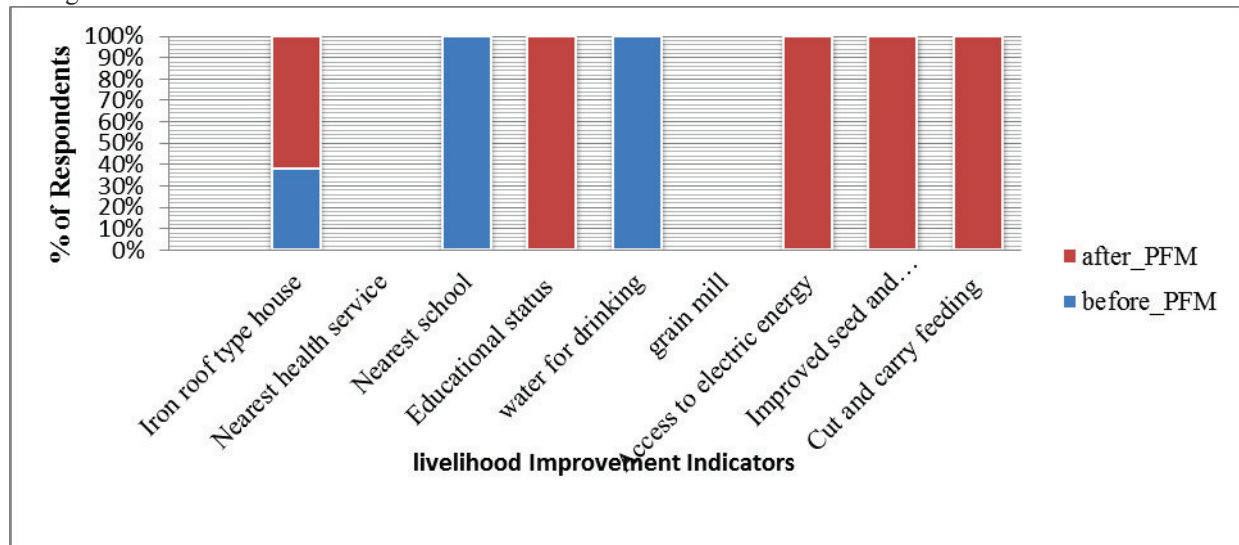


Figure 3.3: Livelihood improvement before and after PFM established

As Figure 3.3 shows, PFM respondents reported that the establishment of PFM has improved their livelihoods. About 62% of the sampled households reported that they have built a corrugated iron roof type house. All the respondents were also reported that their access to education has been improved after PFM has been established. Similarly, the results of focus group discussion also indicated that the major sources of income for PFM members were related to forest. They stated that they own small size of farm land which is insufficient to maintain food security of their households. With the establishment of PFM they are engaged in NTFPs activities such as bee keeping, controlled hunting and pasture for sell which as result has improved their income. The result coincide with previous study conducted by (14) in Kenya. They further stated that, with improved income they were able to send all of their children to school. About 85% of the respondents were also reported that, PFM has improved their access to improved seeds and fertilizer. Moreover, all sampled households reported that they have achieved access to electric energy and improved pasture harvest. To check the significance of the level of livelihood improvement, the Wilcoxon signed rank test of livelihood improvement score was conducted and presented as box plot in figure below:

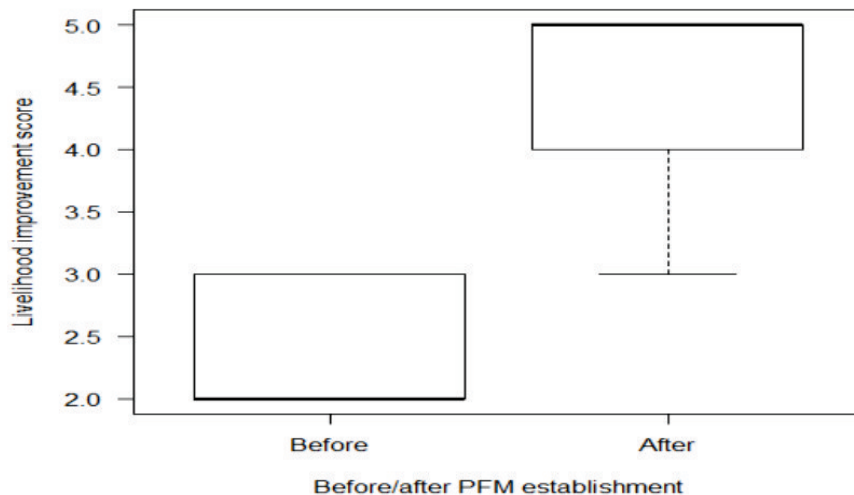


Figure 3.4: Box plot for livelihood improvement score in before and after PFM

The result for statistical test (Wilcoxon signed rank test) of livelihood improvement score (the sum of different improved livelihood activities) before PFM and after PFM establishment found to be significant with p-value = 3.88e-15. According to Wilcoxon signed rank test result, membership in PFM has significant effect on livelihood improvement. This implies that there is significant difference in livelihood improvement of pre-PFM and post-PFM. The study conducted by [15] also concluded that participatory forest management has enhanced the livelihood of the people.

### 3.3 Households' Perceptions towards their Livelihood Diversification

The likerted scale perception tasting questions were presented to PFM members to test their perceptions towards livelihood diversification they have achieved after PFM has established. Accordingly, about 87% of the respondents were agreed that diversified livelihood activities have improved their livelihood over the past 6 years and only 10% disagreed. About 81% of respondent households were agreed that, there are many cash and non-cash oriented benefit their households were obtained from the forest since the establishment of PFM while 16% and 2% were strongly agree and disagree respectively. However, only 37% of respondents agreed that they have alternative source of income besides the forest while 58% and 5% of respondents disagreed and strongly disagreed respectively. Furthermore, the result indicated about 73% of respondents agreed that their dependence on forest has been relieved because of livelihood diversification program of PFM (Table 3.1 and Figure 4.5).

Table 3.1: PFM household's perception towards livelihood diversification

Statements	PFM households (n= 86)									
	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
	n	%	n	%	n	%	n	%	n	%
Diversified Livelihood activities has improved my household over the past 6 years	0	0%	75	87%	2	2%	9	10%	0	0%
As the result of PFM project, my household has alternative source of income besides the forest	0	0%	32	37%	0	0%	50	58%	4	5%
There are many cash and non-cash oriented benefit that my household has obtained from the forest since PFM established	14	16%	70	81%	0	0%	2	2%	0	0%
My household's dependency on forest has relieved because of livelihood diversification program of PFM	9	10.46%	56	65%	0	0%	21	24%	0	0%
My household can cope up with shocks because of diversified livelihoods since the PFM has established	23	27%	62	72%	0	0%	1	1%	0	0%

Note: 1=Strongly Disagree 2=Disagree 3= neutral 4=Agree 5=Strongly Agree

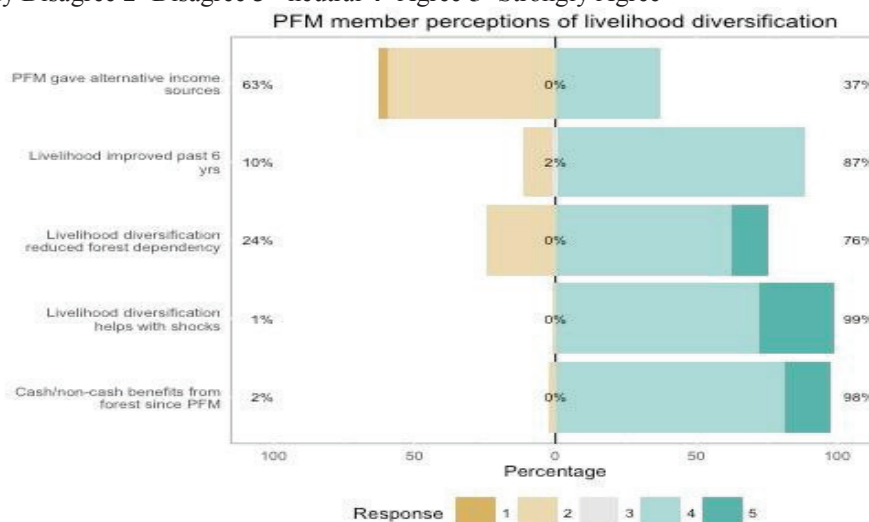


Figure 3.5: PFM household's perception towards livelihood diversification

The above figure clearly depicts that majority of PFM household have positive perception towards livelihood diversification.

### 4. Conclusion and Recommendation

One finding of this study is that establishment of PFM in Jello forest has achieved dual objective of safeguarding the forest and contributing to livelihood of forest dependent community. The result indicates that PFM has significant effect on the livelihood diversification of PFM members. Accordingly PFM households were obtained diversified livelihood activities leading to improved income of households. For instance all households were reported that they have been engaged in controlled hunting, bee keeping and pasture for sell after the establishment of PFM in Jello forest. In addition, livelihood activities that PFM members were used to practice

such as poultry breeding, goat rearing, sheep breeding and especially ox fattening has been increased significantly. They further stated that they were able to send their children to school, access to an improved seeds and fertilizer, achieve access to electric energy and improved pasture harvest. Majority (87%) of the respondents were agreed that diversified livelihood activities have improved their livelihood over the past 6 years and only 10% disagreed. Thus, PFM supported the people to have an improved livelihood and also more diversified income source led to better asset accumulation, and less dependence on the forest. Depending on the findings of the study it is recommendable that PFM is important for the forest resource management and for the forest dependent peoples. Thus, the further expansion of PFM in to other forest areas of the country will help to deal with the problem of deforestation.

### **Ethical Rules**

This research results solely the work of researchers and free from conflict of interest. All data included in the study are original and authentic results.

### **Acknowledgment**

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