

Research Article

# Challenges and Opportunities of Rural Farmers' Participation in Reforestation Program in Chobi District, West Shoa Zone, Oromia Regional State, Ethiopia

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## Abstract

Farmers' participation in reforestation is very useful for the sustainability of forest management. This research conducted in Chobi district, central of Ethiopia the purpose of this study was to assess challenges and opportunities of rural farmers' participation in reforestation program. A mixed research design (a combination of quantitative and qualitative methods of data collection and analysis) was employed and both primary and secondary data were collected. Data were collected through Household survey questionnaire, key informant interview, focus group discussion and personal observation. Descriptive statistics were employed for quantitative analysis while description, narration and content analysis were employed for qualitative analysis. The result of the study revealed that the major practices of participation in reforestation program identified by the rural farmers were tree planting, forest protection and management, area closures and soil and water conservation. The findings also indicated that the major opportunities of rural farmers' for participating in reforestation program were increase local demand for reforestation, growing awareness of the rural farmers' on deforestation of the area, control soil erosion and landslides for agricultural production, rural farmers' culture respect for forest, enhancement of rural farmers' awareness level on reforestation, get extension services and the presence of the forest policy; and the major challenges of rural farmers' participation in reforestation program were low income, climate change, deforestation, forest degradation, landslides, low woman participation in reforestation, lack of research and information exchange. Finally, it necessitates to mobilizing rural farmers for reforestation program on sustainable manner.

## Keywords

Challenges, Opportunities, Rural Farmers', Reforestation Program, Chobi District

## 1. Introduction

Reforestation contributes significantly to sustainable development. That is a green strategy to slow down climate change, avoid deforestation, and lessen deforestation. Reforestation offers several social, economic, and environmental

advantages all at once [1]. In addition to improving the performance of ecosystem services like carbon sequestration and the preservation and upkeep of water supplies, reforestation and forest restoration are acknowledged as efficient ways to

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stop the loss of biodiversity [2]. Reforestation can strengthen livelihood security in tropical developing nations by improving hydrological conditions, increasing the resilience and adaptation of current agricultural systems, and providing households with access to forest resources [3].

Reforestation is the process of restoring lost forests by planting new trees and creating new forests. By providing humans with the necessary environmental and ecosystem services, reforestation is one of the primary ways to lessen deforestation and forest depletion and restore the ecosystem's dignity [4]. Specifically, forest landscape restoration (FLR) that involves smallholders (those who own 10 hectares or less of land) shows potential in integrating ecosystem service provision with livelihood attention [5]. Agroforestry has been used as a nature-based solution to deforestation in the Global South to restore forest landscapes, with varying degrees of success [6].

In many tropical regions, rural communities rely on forests for both environmental benefits and their livelihoods. Many developing nations in the tropics have reforestation efforts because the region's forest resources have drastically decreased during the past century. Current assessments of the effectiveness of these projects typically concentrate on short-term establishment success indicators, despite the fact that reforestation is a long-term process with long-term benefits [7].

One of the Horn of Africa's greatest forest resources is found in Ethiopia. Its 53.1 million hectares of woody vegetation include 40.6 million hectares of woodland and 12.5 million hectares of forest area [8]. Rural people's reliance on forest resources has changed recently due to the rise of markets for ecosystem services and the deployment of reforestation clean development mechanisms initiatives throughout the developing countries [9]. Reforestation initiatives led by civil society organizations are crucial to achieving global climate policy goals and assisting low-income countries in achieving the Sustainable Development Goals of the United Nations [10].

A green legacy initiative plays a crucial role in promoting a healthy environment in Ethiopia by restoring ecosystems, mitigating climate change, and fostering environmental awareness and stewardship. Through its tree planting efforts, the initiative aims to create a sustainable and resilient environment that benefits both nature and the people of Ethiopia [11].

In populations that depend on forests, deforestation exacerbates food poverty and contributes to climate change. The factors that cause deforestation differ depending on the area and are influenced by livelihood systems. However, when creating restoration rules, it is important to consider how the community views restoration. Research indicates that using sustainable farming practices may help save livelihoods and restore forests. Nonetheless, policymakers lose out on opportunities to address deforestation and restoration when they use a wide definition of these issues [12].

Deforestation, which is mostly brought on by the growth of agricultural land, is defined as the loss of forest owing to conversion to other land uses or the permanent decline of

canopy cover below the minimum 10% level that constitutes forest. One of the primary causes of climate change and biodiversity loss is deforestation [13, 14] and Effects millions of households worldwide that depend on forests for their livelihoods in a negative way [15].

The Environmental Protection and Forest and Climate Change Authority and Chobi Agricultural Development offices specifically state that the local government has implemented community-based initiatives to promote reforestation and tree planting. The goal of this study is to identify the opportunities and difficulties associated with rural farmers' involvement in forestry initiatives. However, as far as the researcher is aware, there has been sufficient research on the involvement of rural farmers in the study area's reforestation initiative. In order to encourage rural farmers to actively participate in the reforestation program to enhance their forest in the research region, it is essential to comprehend the obstacles they face.

Rural farmers that participate in forestry programs exhibit high levels of active participation, while they are aware that there are obstacles affecting their involvement, according to data from the Chobi District Agricultural Development Office [16]. Low income, climate change, and low female participation in forestry programs are the data on the obstacles facing rural farmers who want to participate in regeneration. Forest degradation and climate change will continue into the next generation if today's rural farmers are not given the chance to make a life.

None of these studies had focused on the opportunities and challenges of rural farmers' involvement in reforestation programs at the same time. Therefore, the purpose of this study is to close knowledge gaps on the main obstacles and possibilities of rural farmers' involvement in forestry initiatives in the designated study area. In conclusion, this study offers pertinent data regarding the enhancement of rural farmers' involvement in forestry initiatives, which helps to mitigate the issues of deforestation and climate change.

The study, therefore, attempted to assess Challenges and Opportunities of Rural Farmers' Participation in Reforestation Program in two rural villages of Chobi District, West Shoa Zone, Oromia, Ethiopia. The specific objectives of study were: to analyze the practice of rural farmers' participation in reforestation program in the study area, to assess the key challenges of rural farmers' participation in reforestation program and to identify the possible opportunities of rural farmers' for participating in reforestation program in the study area.

The study's main research topics were: How do rural farmers in the study region participate in reforestation programs? What are the primary challenges to rural farmers' involvement in the study area's reforestation initiative, and what opportunities might there be for them to do so?

The findings of this study have implications for how rural farmers participate in forestry initiatives. Second, to evaluate the challenges and potential advantages of rural farmers' involvement in forestry initiatives. Thirdly, to give information



on the design and implementation of the reforestation initiative in Ethiopia and specifically to policy makers, development planners, and non-governmental organizations.

Additionally, it is beneficial to serve as a reference for other research in the field that focus on related or other topics. Lastly, the conclusions and suggestions made will aid in the planning and execution of a reforestation program in the research region.

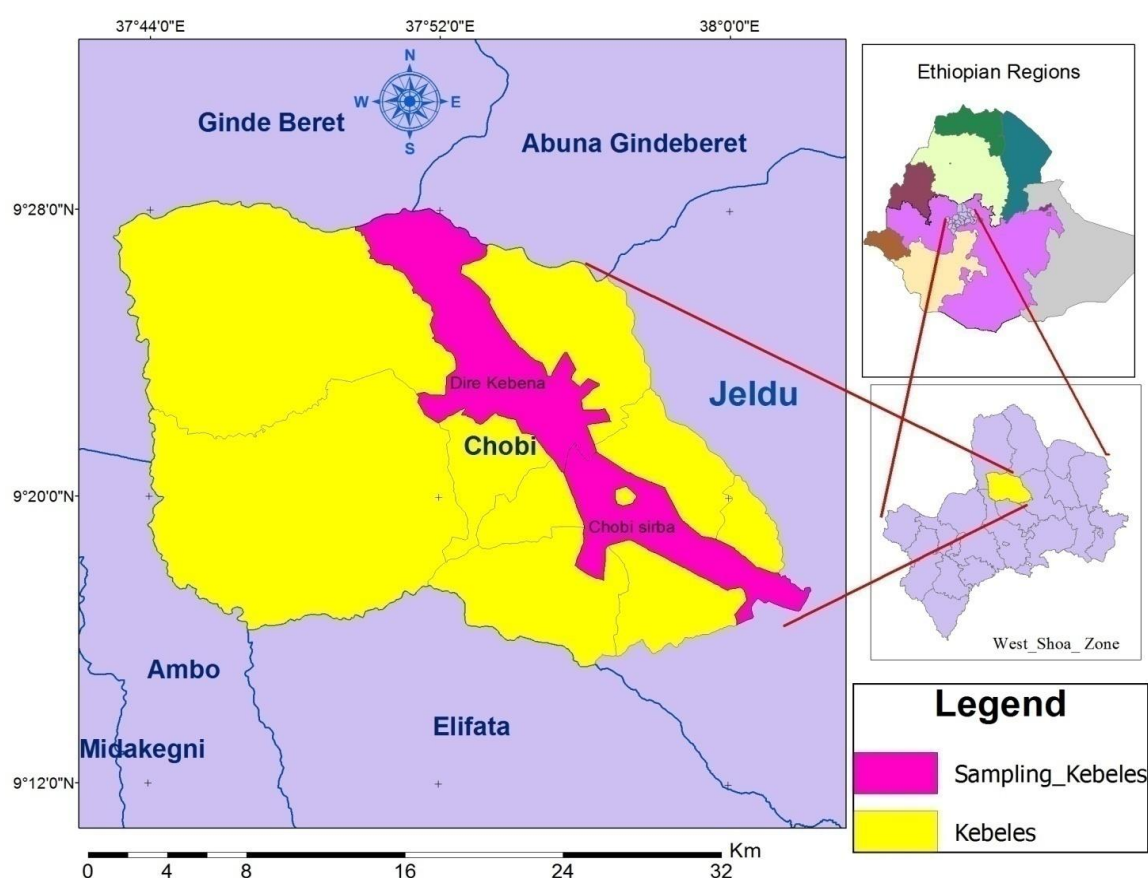
## 2. Research Methodology

This section deals with description of the study area, sampling methods and procedures, methods of data collection,

and methods of data analysis.

### 2.1. Description of Study Area

Chobi District is located in west Shoa Administrative Zone of Oromia Regional State at about 138 kilometers (km) distance from Addis Ababa and 90 kilometers (km) distance from Ambo Town. It is bounded to the North by Abuna Gindeberet and Gindeberet, in the South by Elfeta and in the East by Jeldu and in the West by Ambo Woreda. Chobi district has 11 rural kebeles and one municipality and the study concern on rural area.



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

Agro-climatically, the district is divided into, highland, mid-highland and low land which account 27%, 56% and 17% respectively [17]. The district has total population of 65,482 of which 32,085 males and 33,397 females. The major economic activities are agriculture in which 95% of labor forces are engaged in it. Mixed agriculture which are characterized by crop production and livestock husbandry, is predominant economic activity and the major source of livelihood in the study area. Crop production is mostly dependent on rain-fed and major crops produced in the area wheat, barley, beans, maize, teff, sorghum, and some vegetables and fruits were

also grown mainly in rural area of the district. Livestock husbandry is one of the important livelihood resources particularly in the lowland areas of the district. Cattle, goats, sheep, donkey, and poultry are among the major type of livestock reared in the study area [16].

### 2.2. Research Design and Approaches

This study was followed cross-sectional survey design in order to obtain data concerning the issues under study. A cross-sectional survey design entails a collection of data at



single point in time a sample was selected to describe some large population at that time.

For this study the qualitative and quantitative research approach were employed. Qualitative research approach enables to conduct the study with intent of reporting and assessing multiple realities and evidence based on actual words of different individuals and presenting different perspectives from individuals. Qualitative research approach is considered to be suitable for gaining in depth understanding of underlying reasons and motivations. Quantitative research approach relies on the field data collected using structured questionnaire counts and demonstrates implications of the issue under question.

### 2.3. Sampling Methods and Procedures

In order to conduct the study, a three stage sampling procedures were employed. The stages involved in sampling procedure were:

1<sup>st</sup> Stage Chobi District was selected from West Shoa Zone district purposively. The reason why Chobi district was purposively selected by the researcher is first, among the district in West Shoa Zone the utilized of different of projects like Sustainable Land Management Program (SLMP) and Agricultural Growth Program (AGP) are lower when as compared with other districts [16]. In addition, the researcher had worked in district within agricultural office and had information about the area. Furthermore, there is no research that is related to the topic in the study area.

2<sup>nd</sup> Stage Once the district was selected as a study area; two selected sample kebeles' were by purposively review of secondary data and depending on their degrees of rural farmers' participation in reforestation and challenges faced in reforestation. In this case, among existing kebeles' only two kebeles' namely: Chobi sirba and Dire kebena depended on the Chobi district agriculture office report were selected because the high performance and active participation were lived in these two selected kebeles' especially in chobi sirba [16].

3<sup>rd</sup> Stage is selection of the sample households, from the total population of the study area. To this end, simple random sampling technique was selected employed to 141 households from the existing 1401 total number of household heads of two kebeles' (Chobi Sirba and Dire Kebena). Accordingly, 73, households and 68 households were selected from Chobi Sirba and Dire Kebena respectively based on probability to proportional to size procedure.

### 2.4. Methods of Data Collection

From this study both primary and secondary sources of data were used.

Primary data: primary data were collected by researcher from respondents through household survey questionnaires, Focus group discussion, Key informant interview and per-

sonal observation of rural farmers' participation in reforestation program in the study area.

The secondary data: Secondary sources of data were collected from different published and unpublished materials such as books, other research, journal, official report, plans, annual reports, official records and census records. Both qualitative and quantitative data types were used to address the objectives of the study.

### 2.5. Methods of Data Analysis

To address the objectives of the study data were coded and analyzed through descriptive statistics (frequencies and percentages) with help of Statistical Package for Social Sciences (SPSS version 25). Data collected through Focus group discussion (FGD), key informant interview and personal observations were analyzed through narration, description, and content analysis.

## 3. Analysis of Result

### 3.1. Demographic and Socio-economic Characteristics of Respondents

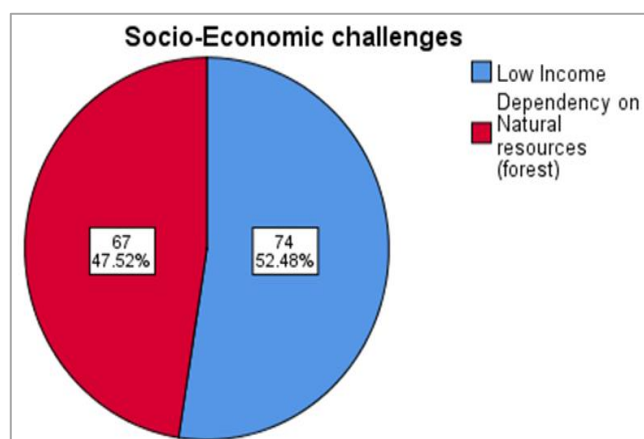
Surveyed result shows that age of sampled respondent 25.5% were between 39-45 years, followed by 23.4% for both age category of sampled respondents i.e. 25-31 and 46 and above years. 85.8% of sampled respondents were from male headed households while 14.2% of them were from female headed households. The family size of sampled respondent was found to be 4-6 members of families, 27%, 19.8%, and 10.6%, sampled of respondents had 7-9, 1-3 and 10 and above members of families respectively. Education level sampled of respondents 26.24% can read and write, while 24.11% attended grade 1-4 and also 24.11% can't read and write, the rest sampled of respondents 17.0% attended grade 5-8 and also 5.7% and 2.84% were grade 9-10 (secondary school) and 11-12 (preparatory school) respectively. Household source of income of sampled of respondents 81.6% were mixed farming (crop production and livestock husbandry), followed crop production and livestock husbandry on which accounts were 9.9% and 8.5% respectively.

### 3.2. Challenges of Rural Farmers' Participation in Reforestation Program in the Study Area

#### 3.2.1. Major Socio-economic Challenge in Study Area

The respondents were asked to indicate their socio-economic status; about 52.5% of respondents mentioned low income and 47.5% confirmed dependency on natural resources. This indicates that the majority of the respondents in the study area (52.5%) were of low income (see figure 2).





Source: Researcher survey results 2022/2023

**Figure 2.** Socio-economic challenges of rural farmers' participation in reforestation program.

### 3.2.2. Major Environmental Challenges in the Study Area

Environmental challenges are a serious problem for rural farmers' participation in reforestation programs in the study area, which result from natural and man-made (artificial) events. Natural events that affect the environment are climate change and landslides, and man-made (artificial) events are deforestation and forest degradation.

The results of Table 2 indicate that the majority of the sample of respondents (70.2%) answered all questions (climate change, deforestation, forest degradation, and land-

slides), and the rest of the sample of respondents (9.2%, 9.2%, 7.1%, and 4.3%) answered climate change, deforestation, forest degradation, and landslides, respectively.

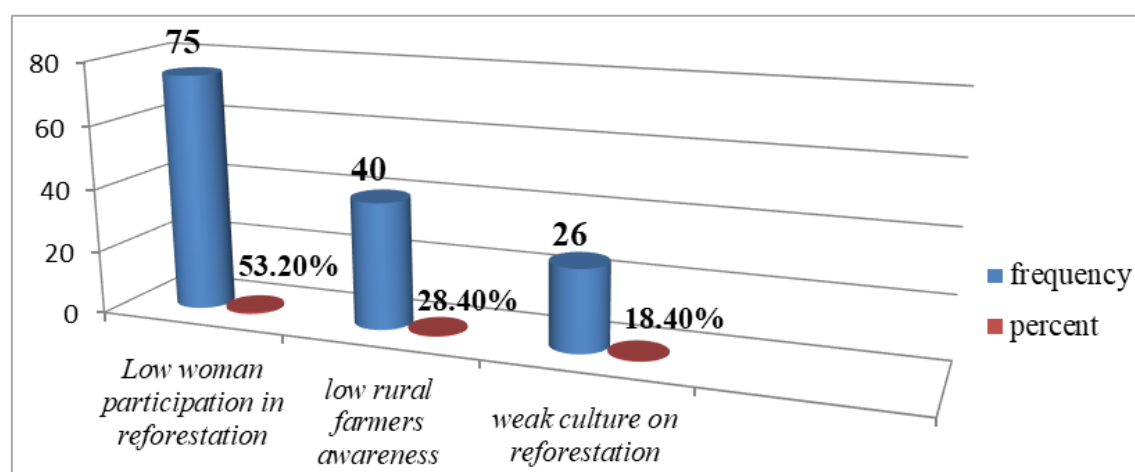
**Table 2.** Major environmental challenges in the study area.

| Environmental challenges | Frequency | Percent |
|--------------------------|-----------|---------|
| Climate change           | 10        | 7.1     |
| Deforestation            | 13        | 9.2     |
| Forest degradation       | 13        | 9.2     |
| Landslide                | 6         | 4.3     |
| All*                     | 99        | 70.2    |
| Total                    | 141       | 100     |

Source: Researcher survey result 2022/2023

### 3.2.3. Socio-cultural Challenges in the Study Area

The respondents were asked to identify commonly occurring socio-cultural challenges in their field, and 53.2% verified low female participation in reforestation as the major socio-cultural challenge in the study area. This was followed by 28.4% and 18.4% who reported low rural farmers' awareness and weak culture on reforestation, respectively (see Figure 3).



Source: Researcher Survey result 2022/2023

**Figure 3.** The major socio-cultural challenges in the study area.

### 3.2.4. Institutional Challenges of Rural Farmers' Participation in Reforestation Program

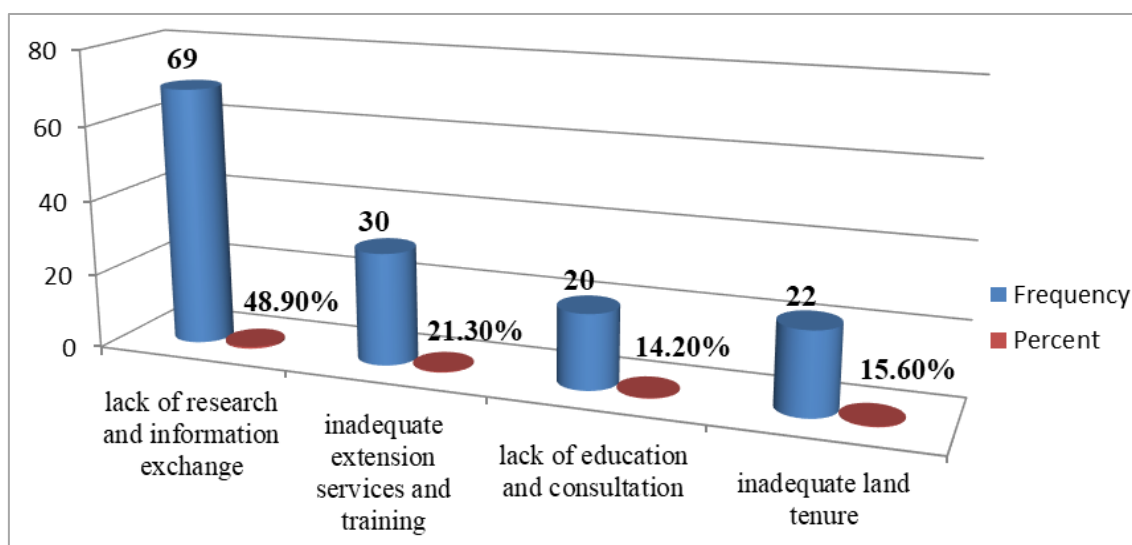
The survey result of this study showed that 48.9% of re-

spondents were lacking in research and information exchange, while the remaining 21.3%, 14.2%, and 15.6% of respondents replied with inadequate extension service and training, lack of education and consultation, and inadequate land tenure, respectively. This indicates that the majority of the respondents



in the study area (48.9%) encountered the institutional challenge of a lack of research and information exchange (see

Figure 3).



Source: Researcher survey result 2022/2023

**Figure 4.** Institutional challenges of rural farmers' participation in reforestation program.

### 3.3. Opportunities of Rural Farmers' Participation in Reforestation Program in the Study Area

#### 3.3.1. Economic Opportunities to Participate in Reforestation

As a result of survey data, regarding the economic oppor-

tunities for rural farmers' to participate in reforestation, 42.6% of respondents replied that increasing local demand for forestation. The left increase of rural farmers' income through time, the provision of a wood supply source that is an alternative to the natural forest, and improved other livelihoods (e.g., increase in food security) were 25.5%, 22.7%, and 9.2%, respectively (see table 3).

**Table 3.** Economic opportunities to participate in reforestation.

| Economic opportunities   | Frequency | Percent |
|--|-----------|---------|
| Increase local demand for reforestation  | 60        | 42.6    |
| Increase of rural farmers' income through time                                     | 36        | 25.5    |
| The provision of a wood supply source that is an alternative to the natural forest | 32        | 22.7    |
| Improved the other livelihood (e.g. increase in food security)                     | 13        | 9.2     |
| Total  | 141       | 100     |

Source: Researcher survey result 2022/2023

#### 3.3.2. Social Opportunities to Participate in Reforestation

The survey result showed that about 40.4% of respondents were growing aware of the rural farmers' impact on defor-

estation in the area, while about 31.9% of respondents were growing aware of the rural farmers' common benefits from common forest resources. Moreover, the remaining 27.7% of respondents enhanced rural farmers' awareness levels in the study area (see table 4).



**Table 4.** Social Opportunities to participate in reforestation.

| Social opportunities   | Frequency | Percent |
|--|-----------|---------|
| Enhancement of rural farmers' awareness level  | 39        | 27.7    |
| Growing awareness of the rural farmers' on deforestation of the area                   | 57        | 40.4    |
| Growing understanding of the rural farmers' common benefits on common forest resources | 45        | 31.9    |
| Total  | 141       | 100     |

Source: Researcher survey result 2022/2023

### 3.3.3. Environmental Opportunities to Participate in Reforestation

The survey result of this study indicated that about 51.1% of respondents responded that they control soil erosion and landslides. This was followed by 12%, 17%, and 19.9% of

respondents for the availability of natural and plantation forest in the area, favorable agro-ecology (agro-climate tree planting management), and decreasing the deforestation of forest, respectively (see Table 5).

**Table 5.** Environmental opportunities to participate in reforestation.

| Environmental opportunities                                    | Frequency | Percent |
|--|-----------|---------|
| Availability of natural and plantation of forest in area       | 17        | 12      |
| Favorable agro-ecology (agro-climate tree planting management) | 24        | 17      |
| Control soil erosion and landslide                             | 72        | 51.1    |
| Decrease the deforestation of forest                           | 28        | 19.9    |
| Total  | 141       | 100     |

Source: Researcher survey result 2022/2023

### 3.3.4. Cultural Opportunities to Participate in Reforestation

The findings of the study indicated that about 36.9% of respondents responded that rural farmers' cultures respect the forest, while 34.8% of respondents replied enhancement of

rural farmers' awareness level on reforestation, and the remaining about 28.4% of respondents responded that rural farmers' cultures promote reforestation (tree planting rather than using them for fuel wood) in the study area (see table 6).

**Table 6.** Cultural opportunities to participate in reforestation.

| Cultural opportunities  | Frequency | Percent |
|---|-----------|---------|
| Cultural change in rural farmers' which promote reforestation / tree planting than using them for fuel wood | 40        | 28.4    |
| Enhancement of rural farmers' awareness level on reforestation  | 49        | 34.8    |
| Rural farmers' culture respect the forest   | 52        | 36.9    |
| Total   | 141       | 100.0   |

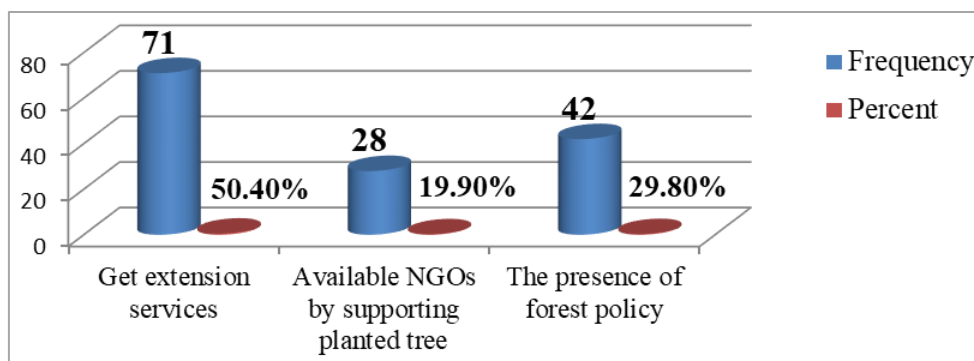
Source: Researcher Survey Result 2022/2023



### 3.3.5. Institutional Opportunities to Participate in Reforestation

As the finding results showed, the Majority of respondents, about 50.8%, got extension services, while 29.8% were aware of the forest policy, and the remaining 23.4% of respondents

responded that available non-governmental organizations (NGOs) supported them by acquiring seedlings, which provided institutional opportunities for rural farmers to participate in reforestation in the study area.



Source: Researcher Survey Result 2022/2023

**Figure 5.** Institutional Opportunities to participate in reforestation.

## 4. Discussion

### 4.1. Practice Rural Farmers' Participation in Reforestation Program

The survey result of this study showed that about 59.6% of household respondents were answer on all\*(tree planting, Forest protection and management, soil and water conservation, area closures) and about 7.8%, 6.4%, 6.4% and 5% of respondents were soil and water conservation, tree planting, forest protection and management and area closures respectively and the rest about 14.9% of household respondents were not participate at all

practices of rural farmers' participation in reforestation in the study area. Additionally, data collected through focus groups discussant, and key informant interview show the study areas rural farmers' participation in reforestation practices participate on tree planting, forest protection and management and soil and water conservation. Moreover, in this practices of rural farmers' participation in reforestation were well participated during planted tree around the forest degraded or decrease the forest quality and high deforestation areas for restore of forest, in the works of soil and water conservation for control the soil erosion and landslide for agricultural production.

Seedling of planted in the study area are species of planted trees like Cordia Africana, Grevillea robusta, Olea Africana, Acacia and Tree Lucerne.



Source: Field Observation, 2022/2023

**Figure 6.** Olea Africana, Cordial Africana and Grevillea robusta.



The findings of focus group discussion in the study area also complements the aforementioned analysis as the study area was reported to be more susceptible and relatively populated.

## 4.2. Challenges of Rural Farmers' Participation in Reforestation Program

Respondents from the both rural villages identified almost similar challenges of rural farmers' participation in reforestation program. Accordingly, economic, environments, socio-cultural and institutional challenges among the other were identified. Those farmers' who choose the hazard level as highly understood related the existence of rural farmers' participation in reforestation low income, climate change, deforestation, forest degradation and landslide, and low woman participation, on other hand low research center and information exchange was claimed as the major challenges for the rural farmers' participation in reforestation program.

## 4.3. Opportunities of Rural Farmers' Participation in Reforestation Program

The finding of the study indicates that opportunities of rural farmers' participation in reforestation were identified by respondent of the farmers'. Therefore, the major opportunities of rural farmers' for participating in reforestation in the study were increase local demand for reforestation, growing awareness of the rural farmers' on deforestation of the area, control soil erosion and landslide for agricultural productivity, rural farmers' culture respect the forest, get extension services and the presence of forest policy in the study area.

## 5. Conclusion

The participation of rural farmers in reforestation efforts presents both significant challenges and valuable opportunities. On one hand, challenges such as low income, and low research and information exchanges, can hinder the active involvement of rural communities. Additionally, environmental factors such as land degradation and climate variability further complicate the prospects for successful reforestation. However, these challenges also open avenues for innovation and collaborative solutions. By increase local demand for reforestation, growing awareness of the rural farmers' on deforestation of the area, control soil erosion and landslides for agricultural productivity and get extension services, opportunities arise for fostering greater engagement from rural farmers in reforestation activities. Ultimately, the successful participation of rural farmers in reforestation not only benefits the environment but can also improve the livelihoods of farmers by increasing resilience to climate change, promoting biodiversity, and enhancing soil fertility. Addressing the barriers and tapping into the potential opportunities will be crucial

for ensuring the success of reforestation programs that are both ecologically and economically beneficial in the long term.

The involvement of rural farmers in reforestation projects presents both substantial challenges and promising opportunities, reflecting the complexities of integrating environmental goals with the practical realities of agricultural livelihoods. Reforestation, defined as the process of replanting trees in deforested or degraded areas, has gained attention in recent years due to its potential to mitigate climate change, enhance biodiversity, protect watersheds, and provide economic benefits to rural communities. As the global population grows and agricultural practices continue to stress the environment, reforestation represents a key strategy for addressing issues such as soil erosion, water scarcity, and loss of biodiversity. Rural farmers, who are often the stewards of large areas of land, can play a central role in such initiatives. However, their involvement is fraught with challenges that must be addressed in order to ensure the success of reforestation efforts.

## 6. Recommendation

It is the worth recommending the following strategic measures for better future of rural farmers' participation in reforestation program:

1. Focusing on male or would help female encouragement in a varieties of activity particularly in relation to incentives from tree and tree plantation increase possibility of participation in tree planting and reforestation activities.
2. The pressing issues of rural farmers' participation in reforestation program was tree planting which rural farmers' participate for reduce the deforestation and climate change and also rehabilitation of the degraded land.
3. Government body should be create job opportunities for rural farmers' who are earned low income can contribute in the improvements of the livelihood of local communities. Additionally, create the diversification sources of income like honeybee production, fattening and fruit and vegetable production.
4. Low woman participation in reforestation program which the resulted from lack of awareness, so government and Non- government organizations should be promote women awareness and empowering woman in forest management. Increasing the woman participation in reforestation program has paramount importance in creating well functional forest management culture among rural farmers' in the study area.
5. Rural farmers' laggard from access to enough information about reforestation and there is no forestry research center in the study area. So, Government and Non- Government organizations should be expanding the forestry research and accessing to useful information



exchange for mobilizing rural farmers of participation in reforestation.

6. Facilitating the participatory approach that make rural farmers' aware of their environmental problems (Climate change, deforestation, forest degradation, landslides) and way of addressing the problems of their day to day activities in reforestation mainly through tree planting and prevent further depletion of existing forest resources.
7. Growing awareness about consequences of deforestation using formal and informal manner will have a vital enhancing rural farmers' participation on different tree planting system.
8. As revealed by the results of this study there are opportunities of rural farmers' for participating in reforestation for this rural kebeles' were good opportunities replicate to other rural farmers', it is well encouraged and advised. So, government structure at lower level and non-government organization should be responsible to long term financial support to rural farmers' participation in reforestation. Because, of new approach and no easily sustain as local community need due to limited asset from the rural farmers'

## Abbreviations

|      |  |
|------|--|
| AGP  | Agricultural Growth Program            |
| FAO  | Food and Agricultural Organization     |
| FGD  | Focus Group Discussion                 |
| FLR  | Forest Landscape Restoration           |
| SLMP | Sustainable Land Management Program    |
| SPSS | Statistical Package for Social Science |

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## Author Contributions

**Disasa Ararsa:** Formal analysis, Data collection, writing-original draft, writing review.

**Workineh Abebe:** Writing editing, Conceptualization.

## Conflicts of Interest

The authors declare no conflicts of interest.

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