

# The Role of Farmers in the Conservation of Selected Indigenous Trees in Semen Bench District, Bench Sheko Zone, South West Ethiopian Peoples Regional State (SWEPRS)

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# **The Role of Farmers in the Conservation of Selected Indigenous Trees in Semen Bench District, Bench Sheko Zone, South West Ethiopian Peoples Regional State (SWEPRS)**

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## **ABSTRACT**

*The objective of this study is to assess the role of farmers in conservation of indigenous trees in Semen Bench District Bench Sheko Zone, SWEPRS. More specifically, the study assesses the awareness level of farmers towards conservation of indigenous trees, identify the indigenous trees at risk of destruction, identify the benefit of indigenous trees to farmers, and the challenges of farmers in conservation of indigenous trees in Semen Bench District. In this study, survey research design was used because of it is suitable to describe the farmers' phenomena in conserving indigenous tree. A mixed approach was used in this study. Quantitatively questionnaires were used to collect data from model farmers while focus group discussion was used to collect qualitative data from development agents and older individuals. The findings of the study show, farmers have low level of awareness about indigenous trees conservation and the multiple uses in increasing land fertility and productivity, for provision of shelter and medicinal use for the community as a result of low awareness numerous local indigenous trees are at a risk of destruction. The other cause for indigenous tree destruction was rapid population growth in the study area which increases demand for farm land, house construction, engagement on charcoal production as a means of business. Recommendations were forwarded: Concerning the low level of awareness of farmers towards indigenous tree conservation, the development agents in District agriculture office should jointly teach people to conserve the indigenous trees at their farm and grazing land. Moreover the major causes for indigenous tree destruction were rapid population growth. Therefore, the health extension workers of the district should focus on awareness creation activities among communities to use family planning. To minimize the number of people engaged in charcoal production as a business in the study area, the development agents with District enterprises and industry office should identify those individuals who are engaged on charcoal production business. Then, give them short trainings and create to them other job opportunities. Side to these like police and other justice bodies should strongly control charcoal production as a business in the study area.*

**Keywords:** conservation, indigenous, trees

## 1 Introduction

Conservation of indigenous tree species is important for re-establishment of ecosystems and provision of livelihood support functions for communities. Thus, the rural communities have relied on indigenous trees for food, medicine and income. These species also contribute to a cleaner environment as they sequester more carbon compared to exotics (1). Trees are important to the well-being of people in every country of the world, providing essential ecological, economic and cultural services. The first global assessment of the conservation status of trees worldwide indicated that around 8000 tree species are threatened with extinction (2). In order to establish planted indigenous tree seedlings on degraded land, all points' access to plantation including gates, individual seedlings, and water crossing were properly covered by fences, and fences were maintained by regular inspection with watchman (3). Different management techniques allow tree growers to optimize tree and shrub products or services. Management techniques may also be applied to reduce negative effects of the presence of trees and shrubs, such as the shading effect on adjacent crops (4).

There is a tension between tree species conservation and forest resource protection. This can best be silent in terms of the threats affecting an individual tree species versus those factors affecting the entire forest resources. Therefore, the effective conservation depends on identifying and countering threats that increase the risk of indigenous tree extinction (5). The different climatic settings and landscape of Ethiopia lead to the creation of suitable growth of habitats. These have led to the occurrence of some unique plant species and their assemblages. Consequently, Ethiopia is one of the countries in the world with high level of genetic diversity of indigenous tree species. The continued exploitation of natural forests without giving due consideration to their propagation, domestication and cultivation has resulted in a vicious cycle where increased forest destruction has led to increased scarcity and/or rarity of forest resources which in turn has resulted in increased demand for forest products and subsequent and further destruction(6).

The natural forests of Ethiopia have been declining rapidly from time to time due to their conversion into arable lands and continued unwise utilization of forest resources. These conditions are triggered mainly by rapid population growth, but also due to ignorance about propagation and field establishment of indigenous trees. The high rate of deforestation has had serious consequences on the ecosystem (7).

In Ethiopia the cutting down trees for fuel wood and construction materials plays a great role for destruction of trees. The nation's wood and tree residues accounting for 77% while about 92% of the nation's total energy comes from biomass sources. Currently, fuel wood is scarce in 75 % of the country (4). There are about 370 indigenous food vegetation in Ethiopia, out of which 182 varieties are trees with edible fruits (8).

As the findings of (7) indicate currently indigenous trees of Ethiopia are declining at an alarming rate. Before, 20 years, Semen Bench District is the well-known site by its indigenous trees. The trees available are by its geographic, local and in Amharic names as follows: cordia Africana (giqu),□□□, bamboo (kyas) □□□, Millettia ferruginea □□□□, and ficus spp (wor) □□, are the known indigenous trees. But these indigenous trees are at a serious risk to distinct. Looking these trees on farm field and in forest becomes seldom.

These shows the trees are at risk to distinct in the study area. Therefore, it is necessary to plan and implement practices that would enhance the reestablishment of these indigenous tree species. The conservation strategy through use clearly presents a challenging one for the conservation of tree species (9).

The fundamental problem which has initiated the researcher to conduct this study was the mass cutting and becoming the distinction of the above listed/selected/ indigenous trees in the District which result for the increasing of land degradation show the low level of the role of farmers in conservation of those indigenous tree on their farm field in Semen Bench District even though the Ethiopian government policy has given high consideration to support and empower farmers in conserving indigenous trees.

### **Objective of the study**

#### **General Objective**

The general objective of this study is to assess the role of farmers in conservation of indigenous trees in Semen Bench District, Selected Kebeles of Bench Sheko Zone.

#### **Specific Objectives**

- To assess the awareness level of farmers about their role in conservation of indigenous trees in Semen Bench District.
- To identify the indigenous tresses at risk of distinction in Semen Bench District.
- To identify the benefit of indigenous trees to farmers in Semen Bench District.
- To identify the challenges of farmers in conservation of indigenous trees in Semen Bench District.

## **2 Research Method**

Under the research method the researcher deals with various procedures and strategies that were useful in the study. It was focused on description of the study area, research design, sources of data, target population, sample size determination and sampling techniques, data gathering instruments, data collection procedures, data analysis and ethical considerations.

### **Description of the Study Area**

#### **Location and population**

Bench Sheko Zone is the one recently restructured Zone divided in to six woredas and two reform Town Administration. Bench Sheko Zone is located in the South Western part of Ethiopia 584 k/m far from the capital city Addis Ababa bordering with West Omo Zone in South and South West, Gambella region in the North West and Kaffa and Sheka Zones in the north and East.

As one can understand from the Zones finance and economic department report, Bench Sheko Zone has a total population of 892,898 with 442,846 males and 450,052 females. Generally the Zone has two Ethnic Groups. They are namely, Bench and Sheko. In addition to indigenous people there are different Ethnic groups migrated and/or settled to the area at different times (10).

Semen Bench District has a total population of 106,490, of whom 51,993 are men and 54,497 women; 5,331 or 5.01% of its population are urban dwellers. The majority of the inhabitants were Protestants, with 64.28% of the population reporting that belief, 19.29% practiced traditional beliefs, and 6.58% practiced Ethiopian Orthodox Christianity (11).

#### **Agro-Ecology**

Bench Sheko Zone has diverse agro ecological zone ranging from semi-arid to tropical climatic zone. According to the traditional climatic classification most part of the zone, about 52% lies under kola (semi-arid), 43% lies under weina-dega (tropical semi humid), while 5% lies under dega (tropical humid) type of agro ecology. The temperature and rainfall of Bench Sheko zone ranges from 15.1 degree centigrade – 27.3 degree centigrade and 400mm – 2000mm respectively. The various agro-ecology of the zone made the area to be endowed with the potential to production of different commercial cash crop the altitude of the zone varies from 500-2500 meter above sea level. The diverse climate, topography, water and forest resource provides a wider range of environment for supporting great variety of inhabitants.

#### **Research Design**

In this study, survey research design was used. A survey research design by its descriptive nature was suitable to describe the farmers' phenomena. Descriptive phenomena must be obtained by means of descriptive research which attempts to describe what is in the social system (12).

#### **Sources of data types**

The researcher has used both primary and secondary data sources for the study. The primary sources of this study were model farmers, development agents, and Old people of the Kebele. The secondary data were gathered from reports of Kebele development agents, Semen Bench District Agriculture office reports. In addition, Zone agriculture department documents were reviewed.

#### **Target Population**

The target population for this study were the district development agents, district model farmers, and old people in the district. The development agents were selected because of they are experts and as a result they can describe the practical challenges in the area concerning the conservation of indigenous tree while old people residents and model farmers are selected to describe their life challenges in conserving indigenous trees and the previous level of indigenous tree species availability in the area.

#### **Sample Size determination and Sampling Techniques**

Since it is difficult to include all the district population in the study area, the researcher preferred to focus on sample model farmers, district development agents, and old people of the district residents.

Accordingly, the researcher was select 50(50%) of model farmers by purposive sampling technique for questionnaire. From district development agents 5(33%) of district development agents were selected by purposive sampling technique for focus group discussion. 3(33%) of known Old peoples of the District residents were selected by purposive method for focus group discussion. The researcher prepared purposive sampling method

because it gives freedom to the researcher to select expected persons who have good knowledge and experience about indigenous tree conservation. In addition the selected sample groups are expected they have knowledge about the role of farmers and the current awareness level of farmers towards the conservation of indigenous trees.

**Table 1 Target Population and Sample Size**

Category of respondents	Semen Bench District		Total	Method of sampling	Data gathering Instrument
	Population	Sample in No	Sample size in %		
Target Kebele Model farmers of District who can read and write	100	50	50%	Purposive	Questionnaire
Target Kebele Known Old Peoples from the District	9	3	33%	Purposive	FGD
Target Kebele development agents in District	15	5	33%	Purposive	FGD
Total	124	58	47%		

**Data Gathering Instruments**

The following instruments were employed to collect data from key informants for the success of the study. Quantitative and qualitative data were gathered from primary and secondary data sources. The data collection was conducted by using the instruments namely, questionnaire and focus group discussion.

**Data Collection Procedure**

Before distribution the data gathering tools were interpreted into local language Amharic. Then the researcher was ensured the research instruments are complete and readily available. The questionnaire was filed by model farmers while focus group discussions were conducted with development agents and Old peoples of the District. Before distribution the number of copies of questionnaires supplied was checked about its adequacy and availability. All respondents were given clear orientation in advance before questionnaire distribution. The researcher was designed and used a schedule representing actual dates and a time framework of each activity.

**Method of Data Analysis**

The data were analyzed in both qualitative and quantitative analysis techniques. Quantitatively, the data obtained by questionnaires were described using frequencies and percentages. Moreover the study was used numerical data to explore traits and situations. Narration was used to analyze data collected by focus group discussion to arrive at results. Following the above techniques the collected data were interpreted to give meaning to the study. Principally this study was used narrations, percentages and tables to summarize the study.

### **3 Theory and Calculation**

#### **Deforestation and Forest Fragmentation**

Deforestation and forest fragmentation is common to Ethiopia, according to (13) the major factors influencing the state of forest genetic diversity of native tree species in Ethiopia are deforestation and forest fragmentation, taking over of habitats by invasive species such as Prosopisjuli flora, expansion of exotic plantations and forest fire. The noticeable conflicts of interest and lack of integration among pectoral activities are severely affecting forest conservation and utilization measures. The other factors with unfavourable effect on conservation and sustainable management of forest genetic resources include fire hazards, illegal logging and encroachment, pest and disease infestations. The fragile institutional capacity and lack of coordination among actors in the forest resource management are also hampering the effectiveness and long term conservation of forest genetic resources. The failure to take positive measures for improving the status of forest genetic resources may lead to further worsening of the resource, which would mean loss of multiple environmental, social and economic benefits and potentials.

#### **Tree and shrub Management**

To optimize tree and shrub products diverse management techniques are practiced by tree growers. The different indigenous tree management techniques may also be applied to reduce negative effects of the presence of trees and shrubs, such as the shading effect on adjacent crops. The largely used management practices are pruning of roots and branches, coppicing, lopping and pollarding. In every occasion a certain management technique is known to be feasible to protection of a certain species, it is indicated. Every young trees which grow fast are more likely to survive if properly weeded and necessary, thinned. Since such general management requirements apply to all species, they have not been indicated in the detailed information on each species (4).

### **4 Results and Discussion**

This section presents data analysis and interpretation of the study. Accordingly the results were presented on level of farmers' awareness towards local indigenous trees conservation, farmers' input in indigenous trees conservation, and the challenges of farmers in conservation practice of local indigenous trees. To come up with new findings to these objectives of the study systematic data gathering, processing, analysis and interpretation was the basic stapes done. Consequently the researcher has gathered the necessary data which were supportive for this specific study from model farmers, older people and development agents. To gather data from these respondent questionnaires and focus group discussion were used. Open and close ended questionnaires were used. Qualitatively 50 model farmers were responded on questionnaire. To support the data collected by questionnaire, focus group discussion was conducted with 5 development agents and 3 Known Old peoples from the District residents. Finally, the demographic characteristics of farmer respondents were presented in the following table.

## Demographic Characteristics of model farmer respondents

**Table 2 Demographic characteristics of model farmer respondents'**

No	Background items	Response	Frequency	Valid in %
1.	Sex of the respondent	Male	42	84
		Female	8	16
		Total	50	100
2.	Age of the respondent	Below 30 years old	4	8
		Between 31 – 40 years old	36	72
		Between 40- 45years old	7	14
		46 years and above	3	6
		Total	50	100
3.	Educational status	Below grade 5	35	70
		Between grade 6 to 12	10	20
		Certificate and above	5	10
		Total	50	100
4.	Marital status	Single	4	8
		Married	41	82
		Divorced	2	4
		Widowed	2	4
		Total	50	100

*Source: field result of (2021)*

Table 2 presents the background characteristics of the model farmer respondents. Accordingly the majority 42(84%) were male and 8(16%) were females. This ensures the greater part of respondents were male.

Concerning the age distribution of the respondents presented in table 2 items 2, the popular 36(72%) were between 31 - 40years old, followed by 7(14%) were between 41- 45years old, 4(8%) were below 30 years old and the rest 3(6%) were 46 years and above. This shows the majority of respondents were 31 -40 years old.

Concerning the education status of model farmer respondents, as indicated in table 2 item 3 presents the majority 35(70%) of respondents were below grade 5, followed by 10(20%) between grade 5 to 12. The rest 5(10%) were certificate and above. This shows the majority of respondents were grade below grade 5 indicates majority of model farmers are illiterate.

Item 4 table 2 shows the marriage status of respondents, as a result the majority 42(84%) were married, while 4(8%) were single, 2(4%) divorced and 2(4%) widowed. From this one can realize the majority of model farmer respondents participated in this research study were with marriage.

## The farmers awareness level towards indigenous trees conservation

**Table 3 the indigenous tree population and farmers' awareness level towards indigenous tree conservation**

No	Item	Responses	Frequency	Valid in %
1.	Howe do you evaluate the current level of indigenous tree population in your area with last 5 years back?	Highly increasing	8	16
		Highly decreasing	38	76
		No change at all	4	8



		Total	50	100
2.	How do you evaluate your awareness level towards the indigenous trees conservation?	High	10	20
		Medium	14	28
		Low	26	52
		Total	50	100

Source: field result of (2021)

The above table 3 presents the awareness level of farmers and the current indigenous tree population, accordingly the majority 38(76%) of model farmer respondents said indigenous tree population is highly decreasing, while 8(16%) said its population is highly increasing and the rest 4(8%) said it has no change at all. This indicates the indigenous trees at District are at high risk of destruction.

Item 2 of table 3 shows the majority 26(52%) of respondents said that they have low awareness about the local indigenous trees conservation, while the rest 14(28%) and 10(20%) responded replied medium and high respectively. This confirms the awareness level of farmers in District has low awareness level towards the indigenous trees conservation.

Moreover, the development agents who were the participants of focus group discussion narrated about the present coverage of indigenous trees in the District and the farmers' awareness about the importance of indigenous trees as follows:

*“Most farmers in the District are valuing indigenous trees at lower level. Their awareness level towards indigenous tree is low. As a result they are distracting the indigenous trees at their farm field, grazing land and use them for firewood, house construction, making charcoal from them and making business. As a result the indigenous trees are at high risk of distinction in the district Kebeles.”*

### The local indigenous trees at risk of destruction in the district

The development agents and old people who were the participants of focus group discussion narrated local indigenous trees at risk of destruction in the district are:

*“There are numerous indigenous trees in the District Kebeles in the past decades. But the populations of these indigenous trees are decreasing from time to time by destruction. Now a days, indigenous trees namely: cordia Africana (giqu),□□□, bamboo (kyas) □□□, Millettia ferruginea □□□□, and ficus spp (wor) □□, are at high risk of destruction.*

**Table 4 concerning the value of indigenous trees to local community in the district**

No	Item	Response	Frequency	Valid %
1.	How do you rate the cultural medicinal value of local indigenous trees?	High	28	56
		Medium	19	38
		Low	3	6
		Total	50	100
2.	How do you rate the importance of indigenous trees to local people in protecting soil erosion?	High	31	62
		Medium	16	32
		Low	3	6
		Total	50	100
3.	How do you rate the commitment of the farmers and local government in conserving indigenous trees?	High	8	16
		Medium	16	32
		Low	26	52

		Total	50	100
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*Source: field result of (2021)*

Table 4 item 1 shows the cultural medicinal value of local indigenous trees, accordingly out 50 model farmers the majority 28(56%) of respondents said it has high value, 19(38%) said it has medium medicinal value and the rest 3(6%) said it has low medicinal value. This implies indigenous trees have high medicinal values for district residents.

Table 4 item 2 shows the benefit of indigenous trees to local people in protecting soil erosion, consequently the majority 31(62%) of respondents said it has high value, 16(32%) said it has medium medicinal value and the rest 3(6%) said it has low medicinal value. This implies the benefit of indigenous trees to local people in protecting soil erosion for District Kebele residents. Moreover the development agents and old people who were the participants of focus group discussion narrated about the benefit of indigenous trees in protecting soil erosion as follows:

*“Basically, most parts of the relief of the Semen Bench District Kebeles mountainous, and hilly. Therefore, the importance of indigenous tree is high to protect soil erosion in the Kebele.”*

Table 4 item 3 presents the commitment of the farmers and local government in conserving indigenous trees in the district Kebeles, accordingly the majority 26(52%) of respondents said their commitment is low, 16(32%) their commitment is medium, the rest 8(16%) said their commitment is high. This implies the commitment of the farmers and local government in conserving indigenous trees in the District Kebeles is low.

### **Discussion on challenges of farmer towards indigenous tree conservation in the District**

The development agents and old people who were the participants of focus group discussion discussed about the challenges of farmers in conservation practice of local indigenous trees in District Kebeles are:

*“The main challenges for farmers in indigenous trees conservation is the rapid growth of population in District Kebeles, as a result the need for firewood, house construction, and grazing land, and farm land increased. Know a day, greater numbers of rural people are engaged on charcoal production as a business, to sustain their life with food. These people get charcoal raw material from trees (indigenous trees). In addition some Indigenous trees are good in increasing productivity of crops under them. But some trees are not good for the crop yield under them. As a result farmers cut and avoid them on the farm field. Some farmers cut and avoid them; some are cut and sold them for charcoal business man/women/ on their farm field.”*

## **5 Conclusions**

Based on the analysis and summary of the findings, the study concludes that: Currently indigenous tree population is decreasing from time to time as a result of high destruction by farmers in the district Kebeles. For this risk of destruction farmers low level of awareness was the major case. The value given to indigenous tree by farmer community is low, as a result they are distracting the indigenous trees at their farm field, grazing land and use them for firewood, house construction, making charcoal from them and making business. Consequently, the indigenous trees are at high risk of distinction in the District Kebeles. Concerning the indigenous trees at risk of distraction, the study indicated cordia Africana (giqu),□□□, bamboo (kyas) □□□, Millettia ferruginea □□□□, and ficus spp (wor) □□, are at high risk of destruction in the District Kebeles. Concerning the benefit of

indigenous tree to District Kebeles residents, the study indicated indigenous trees have high medicinal values for local Kebele residents. Moreover, the Kebeles under study are mountainous, and hilly, the importance of conserving indigenous tree is high to protect soil erosion in the Kebeles. The challenges faced by farmers in indigenous trees conservation, the rapid growth of population in District Kebeles is the major challenging factor, as a result of population growth the need for firewood, house construction, and grazing land, and farm land increased. The other challenges of farmers in conservation of indigenous trees, indicates greater numbers of rural people are engagement on charcoal production as a business. These people are engaged in charcoal production to sustain their life with food. But these people get charcoal raw material from trees (indigenous trees). In addition some indigenous trees are good in increasing productivity of crops under them. But some trees are not good for the crop yield under them. As a result farmers cut and avoid them on the farm field. Some farmers cut and avoid them; some are cut and sold them for charcoal business man/women/ on their farm field.

Based on summary of the findings and conclusion, the following recommendations were drawn. Concerning the low level of awareness of farmers towards indigenous tree conservation, the development agents at District Kebele, District agriculture and development of should jointly teach people to conserve the indigenous trees at their farm and grazing land. The findings of the study show the major causes for indigenous tree destruction was rapid population growth. Therefore, the local government should focus on awareness creation activities of family planning activities to reduce the population growth in District Kebele. The cultural medicinal value of indigenous tree is high in the Kebele; therefore the development agents of the study Kebeles should develop the farmers' awareness to protect those indigenous trees which have cultural medicinal value. Moreover the use of charcoal production as a business is the one cause for forest destruction. So the development agents with District enterprise should identify those who are engaged on charcoal production business. Then, give them short trainings and create to them other job opportunities. Side to these like police and other justice bodies should strongly control charcoal production as a business.

## **6 Declarations**

### **Study Limitations**

In conducting this research, the researcher was faced several limitations that affect the processes and results of the study. The first challenge was the lack of experience of the researcher and lack of secondary sources. Absence of past research works on related topic is also a major obstacle when conducting this research. The researcher was eagerly committed in finding ways through which the mentioned problems solved. Among the strategies used to overcome the challenges, reading different research books, using websites to cover lack of secondary data, consulting senior researchers were the strategies used to cover lack of experience and shortage of secondary data.

### **Ethical Considerations**

The questionnaire and focus group discussion were done after the respondents get the participants to have information about the type of information needed from them. Through this process the researcher was let the participants made informed about the purpose of the research and those who participated were according to their free willingness.

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