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Assessment of Attitude Towards Agro-forestry Practices in Mekelle Zone, Aynalem Kebele

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Abstract: Agro-forestry is a dynamic, ecologically based, natural resources management system that, through integration of trees on farms and agricultural landscapes, diversifies and sustains production for increased social, economic, and environmental benefits for land users at all levels. The expansion of agriculture in Ethiopia has been taking place at the expense of the natural vegetation, particularly forests, woodlands and other wildlife resources, leading to loss of both flora and fauna, and ultimately, destruction of habitats as a whole. This study is conducted to assess the attitude of society towards agro-forestry in Mekelle zone, Aynalem kebele and carry out numerous indigenous and traditional agro -forestry practice. This research has been done using primary data, which is collected by selfe-administered questionnaire, using simple random sampling technique filled by sample respondents. To address our objectives, descriptive statistics such as frequencies, charts and inferential statistics such as chi-square test and logistic regression model were used for the data analysis. In addition, the study used computer software SPSS, for data analysis and to organize the output. Tree growing conservation and management on agricultural land and in forested areas have been taking place by rural people since the beginning of settled agriculture, for the purpose of food, shelter, ceremonial or religious purpose. As we observed from the study almost half of the population were less satisfied towards agro-forestry practices. The variables such as the education condition of the societies, the condition of the environment, the area of the plant are planted, the best place the planter prefer to plant the tree and the reason to plant tree at home compound/farm are the significance variable have effect on the attitude of the societies towards to agro-forestry.

Keywords: Agro-forestry, Management, Agricultural, Landscapes, Environmental

1. Introduction

Agro-forestry is a dynamic, ecologically based, natural resources management system that, through integration of trees on farms and agricultural landscapes, diversifies and sustains production for increased social, economic, and environmental benefits for land users at all levels [1]. Also defined as the intimate integration of trees and crop or animals in the farming system or, more widely, as the integrated management and use of forest and agricultural resources. Agro-forestry had a long history, from man's earliest attempts at agriculture to the past time, even in the most industrialized countries. Prior to the 1970 the worldwide forest development project were focused on large monoculture plantation of forest growing trees. [2]. During this time agro-forestry becomes more accepted as the systems of land used responding to the needs of the population. In the early time, this agro-forestry practice was not applicable just as today's agro-forestry practice. Today agro forestry research is conducted by universities, government agencies, individual agricultural producers and other organizations. Agro -forestry is practiced by private citizens and public institutions [2]. In order to develop successful and adoptable agroforestry interventions as part of a rural development strategy, it is essential to base research on the knowledge and attitudes of local farmers. Traditionally, most African farmers have cleared land, used it until fertility began to decline, and then moved on. As the soil became exhausted and the farmers moved on, a variety of trees and shrubs would quickly reestablish itself. During the land's fallow period, the roots of this woody vegetation would return leached nutrients to the topsoil from layers of

earth deep below the surface. Eventually, the soil's productivity would be restored, and farmers would return to grow crops there once again. This cycle was interrupted when population pressures forced farmers to settle and to use land much more intensively. Fallows were shortened or eliminated, preventing the natural reforestations that had been such an essential part of traditional agriculture. Trees that would formerly have been left in and around gardens were cut to provide firewood or to make way for more crops. Erosion is made worse by the absence of trees that could break the flow of wind and water there might have been less human suffering and less permanent damage to the land if traditional farming systems - including traditional trees and shrubs - had still been in place.

Ethiopia is situated in the horn of Africa with a population of above 85 million and annual rate of growth of 3.2 percent is overwhelmingly an agricultural country [3]. Reports on the forest resources of Ethiopia are dominated by the alarming deforestation that goes on unabated and at an accelerating rate [3]. Deforestation takes place in both forests and farm woodlands and it is recognized as the most severe environmental problem in Ethiopia. The National Conservation Strategy of the Federal Republic of Ethiopia identifies deforestation as a major problem, not only in the forest proper, but also as it affects other sectors such as crops, animal husbandry, water resources, and wildlife habitat [4].

According to Rain tree (1987), agro -forestry is usually viewed as an unconventional way of raising trees by foresters and unconventional cropping method by agronomists [5]. The future holds that both agricultural and forest products are needed by rural people simultaneously [6], not alternatively. Agricultural forest provides construction materials woods and timber and in forest, there are rare medicinal plants are available in forest. Forest products are honey; charcoal provides employment opportunities for tribal population. In general agro-forestry is unlimited importance for the population and animals that means forest is important for living and non-living things. In the late 19th century about 46% of Ethiopia was covered with forests. Forest resources are an important endowment of the country in contributing production, protection and conservation functions in themselves [7, 8]. The expansion of agriculture in Ethiopia has been taking place at the expense of the natural vegetation, particularly forests, woodlands and other wildlife resources, leading to loss of both flora and fauna, and ultimately, destruction of habitats as a whole. The deforestation activities, expansion of agriculture and unsustainable use of environmental resources especially forests and forest products have been increasing at alarming rate. Such destruction in Ethiopia has resulted in soil erosion, poverty, food insecurity and recurrent draught, extinction and loss of biodiversity, and global warming and climate change [1]. Tree growing conservation and management on agricultural land and in forested areas have been taking place by rural people since the beginning of settled agriculture, for the purpose of food, shelter, ceremonial or religious purpose. The current literature [9-13] shows that perception and attitudes toward trees, transaction cost incurred in searching for market information, production costs in establishing and maintaining the technology, benefits of the technology, sources of information and demographic information play a large role in the adoption of agro forestry.

2. Methods and Materials

2.1. Study Area and Data Source

The study is conducted in keble Aynalem. Aynalem is located at Mekelle zone; northern part of Ethiopia in Tigray National Regional State, at a distance of 783 km from Addis Ababa. keble Aynalem has 5 ketenas. These are Shift, Degya, Argosh, Hinstatelem, and Limatendusitiry [14]. The study population is all people live in keble Aynalem. The total numbers of population live in keble Aynalem is 10,380. Our target population is the total population who live in the two ketenes. These are Argosh and Degya. The total numbers of people in the two ketenes are 4226. We have taken these two ketenes because, the life style of people in the two ketene's is like a rural and they practice agro-forestry.

2.2. Research Design

An institution based cross-sectional study design was conducted.

2.3. The Dependent Variable

The dependent variable of the study was attitude of the society.

2.4. Independent Variables

Table 1. *Independent Variable.*

Explanatory variable	Categories
Types of tree species	Domestic =1, Wild =2, both=3
Age of the planter	<15=1, 15-25= 2, 26-35=3, >35=4
The uses of trees	For fuel =1, For constriction =2, To wide plough land= 3
Condition of education	Illiterate=0 Literate
Environmental condition	No=0, Yes=1
Wild animals in the locality	No=0, Yes=1
Problems encounter to tree production	Shortage of labour = 1, Shortage of cash= 2, Types of tree= 3, The use of tree= 4, Age of planter= 5
Land	Home compound=1 Farm boundary= 2 Around road= 3 Deforested area= 4

2.5. Methods of Data Analysis

The method of data would be analyzed by using descriptive statistics and inferential statistics for data analysis. To highlight descriptive results, we used frequency distribution and percentages. The Chi-squared test of association was employed to examine the relationship between dependent and independent variables. The logistic regression model was utilized to identify attitude of society towards Agro- Forestry practice. Multivariable logistic regressions were conducted by taking all significant variables in the univari-able analysis at 25% level of significance [14]. We used SPSS version 20 to perform all descriptive and inferential statistics.

2.5.1. Methods of Data Collection and Sampling Design

This research has been done using primary data, which is collected by selfe-administered questionnaire ffilled by sample respondents. The sampling design used is simple random sampling using the target population (frame) [15]. Because, a simple random sampling technique provides equal chance for each member in the population. The study design is Cross-sectional study refers to observations of many different individuals (subjects) at a given time (at the same point of time), each observation belonging to a different individual.

The sample size determination formula adopted for this study is;

$$n = \frac{no}{1 + no/N}$$

$$no = \frac{(Z\alpha/2)^2 pq}{d^2} = \frac{(1.96)^2 * 0.5 * 0.5}{(0.1)^2} = 96.04 \approx 97$$

Where, $Z_{\alpha/2}$-desired level of confidence, 95%=1.96

α- level of significance= 0.05

d- Marginal error, d=10%

p- Proportion of sample, who is satisfy by service of agro forestry, p=0.5.

q- Proportion of sample, who is not satisfy by service of agro forestry.

N=4226-is total populations of the two ketene.

If $n_o/N>0.05$ we have to adjust, but if $n_o/N<5\%$ use $n_o=n$ (Cochran, 1997).

However, 97/4226=0.02295<0.05 no need of adjustment. Then we take $n=n_o=97$.

Therefore**,** 97-is sample size of our study.

2.5.2. Descriptive Analysis

Descriptive statistics consists of the collection, organization, summarization and presentation of data in meaningful forms by using tables, charts and graphs. It may be computed by the measures of central tendency (Mean, Median, Mode, etc) and measures of variation (range, variance, etc).

2.5.3. Inferential Statistics

Inferential statistics induces the use of data from sample to make inferences about population from which sample are drawn. In other word, it is the set of methods used to generalize sample to population by performing hypothesis-testing, determining relationship among estimates of variable and making decision.

2.5.4. Chi-Square Test of Independence

Chi-square test is amethod of analysis for data obtained from categorical variabels. The data was the from of counts. A chi-square distribution is a function of its degree of freedom. This distribution is skewed the right and the random variable can never take a negative value. The objective of chi-square test of independence are to test whether there is arelation ship between two categorical variables or not.

Assumption of Chi-square.

Each cell and every individual object is independent of each other.

Each number qualifies for one and only one cell in the table.

It is required sufficiently large expected frequency for each cell.

The data are obtained from random sample.

The variable under the study is categorical.

Test procedures for chi-square.

Step 1. State the hypothesis.

H_o: the two attributes are independent or not significantly association between them.

H_1: the two attributes are dependent or significantly association between them.

Step 2. Level of significance, α =0.05.

Step 3. Test statistics.

$$\chi^2_{cal} = \sum\sum \frac{(oij - Eij)2}{Eij}$$

Where E_{ij}= expected frequency for cell (i,j)

$E_{ij}=\frac{ni.*n.j}{n}$

$n_{i.}$=i^{th} row total

$n._j$= j^{th} columns total

n = total sample size

O_{ij}= observed frequency in cell (i,j)

The degree of freedom associated with contingency table possessing r-rows and c-columns= (r-1)(c-1)

Step 4. Finding the critical value (χ^2(r-1)(c-1),α)

Step 5. Decision rule

If $\chi^2_{cal} > \chi^2$ $(r-1)(c-1)_\alpha$, then reject H_o, otherwise no enough evidence to reject the null hypothesis.

Step6. Conclusion based on the decision [16].

2.5.5. Logistic Regression Model

Logistic regression is used to predict a categorical variable from a set of predictor variables. Binary logistic regression response variable is dichotomous variable (i.e. it takes only two values, which usually represent the occurrence and non-occurrence, or success or failure, or β.

Satisfy or dissatisfy of some outcome events usually coded as 0 or 1) and the independent variables are continuous, categorical or both [16, 17].

In logistic regression model assume that the explanatory variables affect the response through suitable transformation of the probability of success, Πi (odds of success). The most commonly used method of estimating the p+1 unknown parameters (βo, β1,…βp) of logistic regression model is the me thod of maximum likelihood (ML). ML methods seek to maximize the log likelihood (log[p(x)] which reflects how likely it is that the observed values of the dependent variables may be predicted from the observed value of the independent variables.

2.5.6. Binary Logistic Regression

When the dependent variable is dichotomous, such as the existence or absence of a certain event, binary logistic regression is utilized, and the independent variables can be of any type. For Bernoulli trial, Bernoulli distribution defines probabilities P (Y =1) = π and P(Y=0) =1- π, with E (Y) = π.

The general model for binary logistic regression is as follows:

$$\log it(\pi(xi)) = \log\left(\frac{\pi(xi)}{1-\pi(xi)}\right) = \beta o + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_K X_k$$

Where: x_i is an explanatory variable in the model, π: the probability of success, 1-π: the probability of failure, β_o is constant terms/intercept, β_i is the coefficients or slope of the explanatory variable in the model.

Assumption of Logistic Regression.

1. The dependent variable must be a dichotomy (two categories) for binary logistic regression model.
2. Linear relationship between the logit (natural log of the odds of the dependent variable is occurring or not) and the predictors.
3. There should be meaningful coding of variable.
4. There is no assumption of homoscedasticity.
5. The dependent variable need to be normally distributed.
6. Logistic regression does not assume a linear relationship between the dependents and the independents variables, because it applies a non-linear log.

2.5.7. Parameter Estimation for Logistic Regression

The maximum likelihood and non- iterative weighted least squares are the two most computing estimation methods used in fitting logistic regression model [17, 18]. When the assumption of normality of the predictors does not hold, the non-iterative weighted least squares methods is less efficient. In contrast, the maximum likelihood estimation method is appropriate for estimating logistic model parameters due to this less restrictive nature of the underlying assumptions [14] hence in this study the maximum likelihood estimation technique will be applied to estimate parameter of the model [16].

The maximum likelihood estimates of the parameters could be obtained by maximizing the log-likelihood function form is given by

$$\pi(xi) = \frac{\exp(\beta o + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_K X_k)}{1 + \exp(\beta o + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_K X_k)}$$

Since observing values of Y say, $Y_i's$ $(i = 1, 2 \ldots n)$ are independently distributed as Bernoulli, the maximum likelihood function of Y is given by:

$$L(\beta / y) = \prod_{i=1}^{n} P(y_i / x_i) = \prod_{i=1}^{n} \left[\frac{e^{x_i \beta_i}}{1 + e^{x_i \beta_i}}\right]^{y_i} = \left[\frac{1}{1 + e^{x_i \beta_i}}\right]^{(1-y_i)}$$

3. Assessing Model Fit

3.1. The Wald Test Statistic

The Wald statistic is commonly used to test the significance of individual logistic regression coefficients for each independent variable (that is, to test the null hypothesis in logistic regression that a particular logit (effect) coefficient is zero, i.e, $\beta_i=0$ against $\beta_i \neq 0$) at α level of significance. Wald test is a way of testing the significance of particular independent variables in a statistical model [40]. Wald χ^2 statistics are used to test the significance of individual coefficients in the model and are calculated as follows:

$$W = \left(\frac{\beta}{se(\beta)}\right)^2 \sim \chi^2_{(1)}$$

W has χ^2 distribution with one degree of freedom. se(β) represents the standard error of regression coefficient β. The significance of the Wald statistic indicates the importance of the predictor variables in the model and high values of the Wald statistic shows that the corresponding predictor variable is significant.

3.2. The Hosmer-Lemeshow Test

The final measure of model fit is the Hosmer and Lemeshow goodness of fit statics, which measures the correspondence between the actual and predict values of the dependent variable. The Hosmer and Lemeshow test is commonly used test for assessing the goodness of fit of model and allows for any numbers of explanatory variables, which may be continuous or categorical [40].

The Hosmer Lemeshow test statistics is defined.

$$C^2 = \sum_{i=1}^{p} \left[\frac{(O_i - E_i)^2}{m_i p_i (1 - p_i)}\right]$$

Where O_i, E_i, m_i, p_i are denotes the observed events, expected, observations and, the average predicted risk for the i^{th} risk desire group respectively.

The statistical hypothesis of the Hosmer Lemeshow test.

H_1: The model is good to fit the data.

H_0: The model is not good to fit the data.

The decision rule is we do not reject the null hypothesis if the p-value > α value=0.05.

4. Result and Discussion

We use descriptive statistics such as frequency distribution, bar charts and pie chart to explain the general characteristics of some attribution in the study.

Table 2. *Summary descriptive statistics for categorical variable in Agro –forestry practice level.*

Variable	Category	Agro-Forestry Practice					
		Satisfactory		Less Satisfactory		Total	
		Count	%	Count	%	Count	%
Sex	Male	36	70.6	21	45.7	57	58.8
	Female	15	29.4	25	5403	40	41.2
Interest	Yes	49	96.1	46	100	95	97.9
	No	2	3.9	0	0	2	2.1
Species	Domestic	14	27.5	23	50	37	38.1
	Wild	3	5.9	3	6.5	6	6.2
	Both	34	66.7	20	43.5	54	55.7
Education condition	Illiterate	15	29.4	35	76.1	50	51.5
	Literate	36	70.6	11	23.9	47	48.5
Age	<15	3	5.9	5	10.9	8	8.2
	15-25	12	23.5	15	32.6	27	27.8
	26-35	20	39.2	14	30.4	34	35.1
	>35	16	31.4	12	26.1	28	28.9
Place of plant tree	Home compound	11	21.6	26	56.6	37	38.1
	Farm boundary	13	28.3	17	33.3	30	30.9
	Around road	3	5.9	2	4.3	5	5.2
	Deforested area	20	39.2	5	10.9	25	25.8
Place prefer to plant	Home compound	16	7.8	9	19.6	13	13.4
	Farm boundary	4	32.2	7	13.7	22	22.7
	Around road	36	7.8	5	10.9	6	9.3
	Deforested area	47	70.6	17	37	53	54
Reason to prefer the place	To obtain suitable condition	9	17.6	11	23.9	20	20.6
	To protect erosion	23	45.1	17	37	40	41.2
	To protect external danger	4	7.8	8	17.4	12	12.4
	To keep fertility of soil	15	29.4	10	21.7	25	25.8
Environmental conduction	Yes	40	78.4	43	93.5	83	85.6
	No	11	21.6	3	6.5	14	14.4
Problem tree production	Shortage of labor	13	25.5	11	23.9	24	24.7
	Shortage of cash	18	35.3	15	32.6	33	34
	Shortage of equipment	10	19.6	1	2.2	11	11.3
	Knowledge	10	19.6	19	41.3	29	29.9
	Shortage of land	24	47.1	21	45.7	45	46.4
Factor influence	Lackoftreeproductn	14	27.5	7	15.2	21	21.6
	Types of tree	6	11.8	10	21.7	16	16.5
	The use of tree	2	3.9	0	0	2	2.1
	Age planter	5	9.8	8	17.4	13	13.3
Animal influence	Yes	24	47.1	20	43.5	44	45.4
	No	27	52.9	26	56.8	53	54.6
Tree on your farm or compound	Yes	49	96.1	43	93.5	92	94.8
	No	2	3.9	3	6.5	5	5.2
If your answer why	For constriction	16	31.4	21	45.7	37	38.1
	To obtain fuel	7	17.7	8	17.4	15	15.5
	To obtain wood	11	21.6	14	30.4	25	25.8
	To conserves species tree	17	33.3	3	6.5	20	20.6
Purpose of tree	For fuel	17	17.5	21	45.7	38	39.2
	For constriction	21	40.2	17	37	38	39.2
	To wide plough land	13	25.5	8	17.4	21	21.6

As we observe from the above frequency table 2 Agro –forestry practice level of the society differs by respondent's age group. The highest percentage (32.6%) of Agro –forestry practice level of the society less satisfied are observed in the age group 15-25 followed by age group 26-35, whereas the lowest percentage (10.9%) of Agro –forestry practice level of the society less satisfied are observed in the age group less 15.

Concerning the education condition of the society Agro –forestry practice level differs by respondent's education condition. The highest percentages (76.1%) of the less satisfied agro –forestry practice level of the society are observed on illiterate populations. Whereas the lowest percentage (23.9%) of the less satisfied agro –forestry practice level of the society are observed on literate populations and the only 29.4% of the satisfied agro –forestry practice level of the society are observed on illiterate populations Whereas the highest percentage (70.6%) of the satisfied agro –forestry practice level of the society are

observed on literate populations. In addition, the satisfaction of the society by their Agro –forestry practice level differs by place/land of the tree planted. The society less satisfied by their Agro –forestry practice had highest (56.6%) for those who are planted the tree at the area of home compound, while, the lowest (10.9%) less satisfied populations by their agro –forestry practice level are planted the tree at around deforested area. The Agro –forestry practice level of the society differs by species of plant. The highest percentage (50%) of the Agro –forestry practice level of the society less satisfied are observed on the domestic plant species Whereas the lowest percentage (6.5%) of the less satisfied agro –forestry practice level of the society are observed on the wild plant species. The highest percentages (66.7%) of the satisfied agro –forestry practice level of the society are observed on the plant species both domestic and wild.

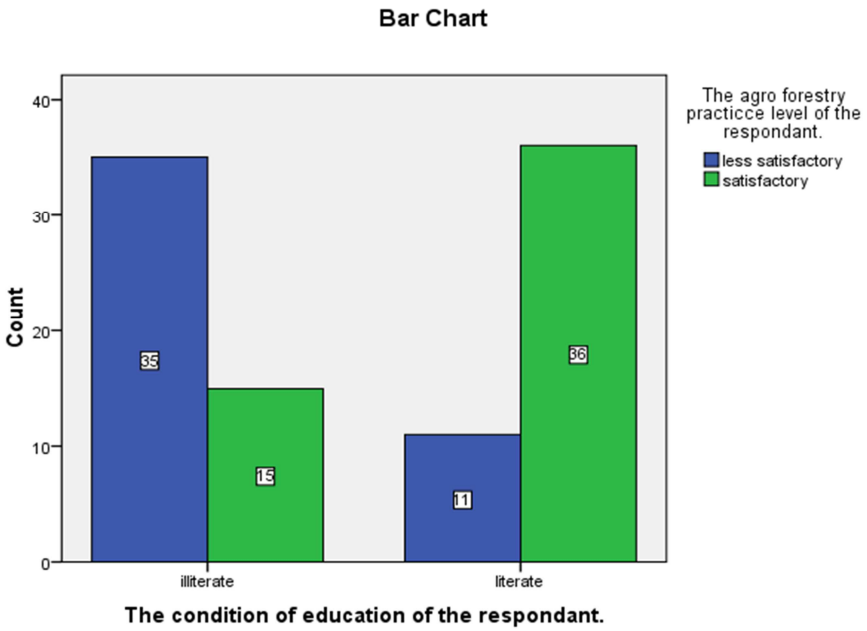

Figure 1. *Conduction of education.*

when we see the education condition of the population from the above bar- chart 47 (48.4%) are literate. from these literate population 36 (76.1%) are satisfied by their agro forestry practice and 11 (23.9%) are less satisfied by their agro forestry practice. 50 (51.6%) of the population are illiterate from these 15 (30%) are satisfied and 35 (69.4%) are less satisfied by their agro forestry practice.

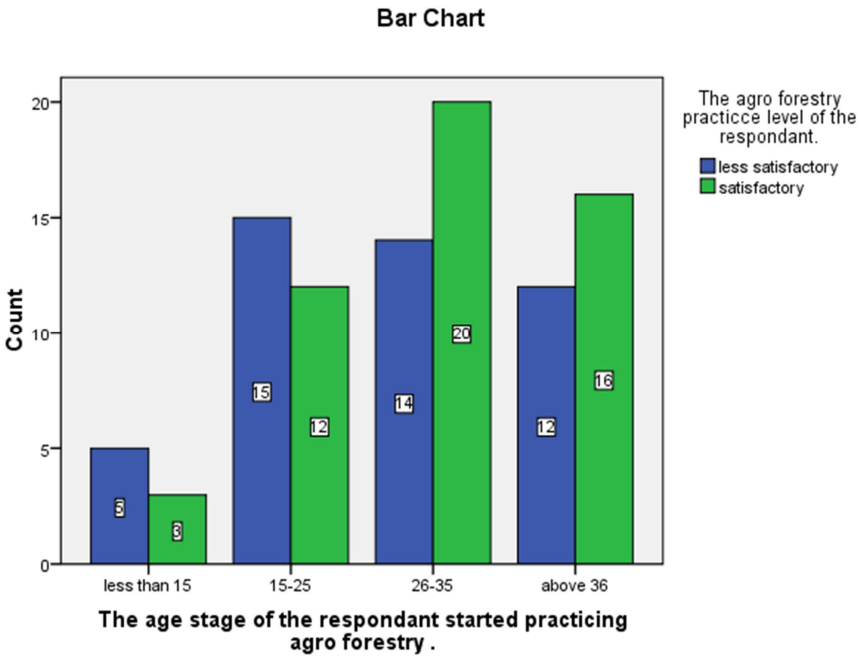

Figure 2. *Bar chart of age of respondents.*

As we observe from the above bar-chart, the age group that practice more agro forestry in the society is 26-35, which are 34 (33.7%). In this age group 20 (59%) of the population are satisfied by their agro forestry practice and 14 (40.6%) of the population are less satisfied by the practice. The population age group <15 are 8 (8.4%) and they have the least agro forestry practice level. from this 3 (37.5%) are satisfied by their agro forestry practice and 5 (62.5%) of the population are less satisfied by the practice.

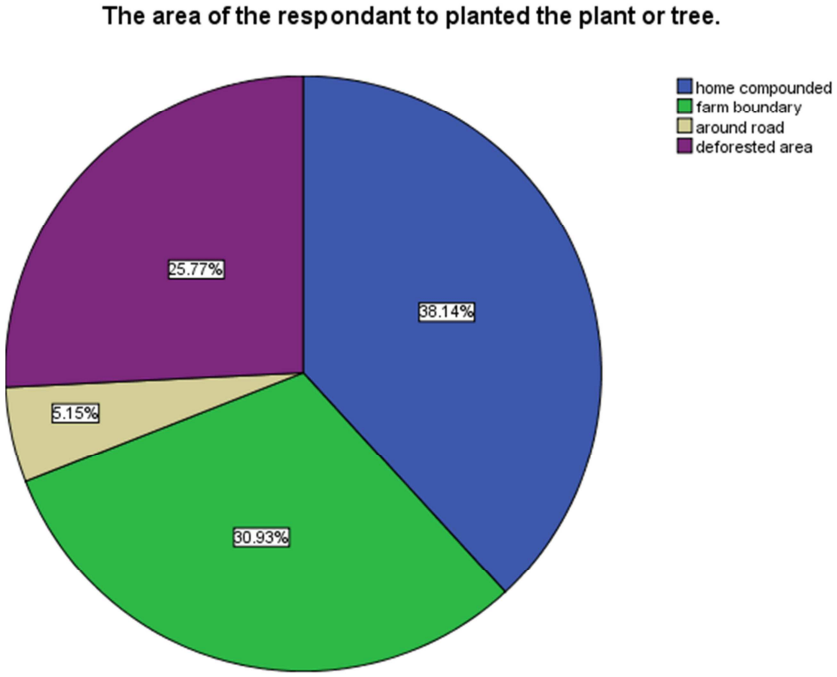

Figure 3. *Pie-chart of the area of the respondent prefer to plant.*

From the above pie chart 38.14% of the societies who plant trees on their home compound and 30.93% who plant trees on farm boundary, 5.15% who plant trees around the road and 25.77% who plant tree son deforested area. So, as we observe from the above description of pie-chart more of the populations planted the tree at home compound.

Table 3. *The best place the respondant prefer to plannt tree.*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.527[a]	3	.009
Likelihood Ratio	11.769	3	.008
Linear-by-Linear Association	10.570	1	.001
N of Valid Cases	97		

From the above chi- square table, since the pearson chi-square = χ^2_{cal}=11.527 is greater than the tabulated $\chi^2_{0.05}(1)$= 3.841 and the corresponding p-value = 0.009 which is less than the level of significance α=0.05. So, we have significance evidence to reject the null hypothesis. From this we conclude that, there is association between the best places the respondents prefer to plant trees in the future with attitude of the society.

Table 4. *The conduction of education of respondent.*

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	21.096[a]	1	.000		
Continuity Correction	19.269	1	.000		
Likelihood Ratio	21.979	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	20.879	1	.000		
N of Valid Cases[b]	97				

From the above chi- square table, since the pearson chi-square = χ^2_{cal}=21.096 is greater than the tabulated $\chi^2_{0.05}(1)$= 3.841 and the corresponding p-value = 0.000 which is less than the level of significance α=0.05. So, we have significance evidence to reject the null hypothesis. From this we conclude that, there is association between the conduction of education of respondent with attitude of the society.

Table 5. *The area of the respondent of the planted tree.*

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.598[a]	3	.001
Likelihood Ratio	16.375	3	.001
Linear-by-Linear Association	14.539	1	.000
N of Valid Cases	97		

From the above chi- square table, since the pearson chi-square = χ^2_{cal}=15.598 is greater than the tabulated $\chi^2_{0.05}(1)$= 3.841 and the corresponding p-value = 0.001which is less than the level of significance α=0.05. So, we have significance evidence to reject the null hypothesis. From this we conclude that, there is association between the areas of the respondent of the planted treewith attitude of the society.

Table 6. *The specie of tree that are good to plant.*

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.576[a]	2	.062
Likelihood Ratio	5.625	2	.060
Linear-by-Linear Association	5.518	1	.019
N of Valid Cases	97		

The above table 6 show p-value 0.062>α=0.05 and Pearson Chi-Square is 5.576 so we have no significance evidence to reject the null hypothesis. We conclude that, there is no associations between the species of tree are good to plant with the attitude of the societies the agro-forestry practice at 0.05 level of significance. Based on the result of the sample data the species of tree has no effect on the attitude of the societies towards to the agro-forestry practice.

Binary Logistic Regression.

Table 7. *Constant variable in the model.*

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.103	.203	.258	1	.612	1.109

Under Variables in the Equation, we see that the intercept-only model is ln(odds) =.103. If we exponentiating both sides of this expression we find that our predicted odds [Exp (B)] = 1.109. That is, the predicted odds of satisfactory are 1.109. Since 46 of our subjects is less satisfactory and 51 of satisfactory, our observed odds are 51/46 =1.109.

Block 1: Method = Forward Stepwise.

Table 8. *Omnibus Tests of Model Coefficients.*

		Chi-square	Df	Sig.
Step 1	Step	21.979	1	.000
	Block	21.979	1	.000
	Model	21.979	1	.000

When we look at the Block 1 output, the Omnibus Tests of Model Coefficients gives us a Chi-Square value of 21.979 with 1 df, significant at 0.05 level.

Ho: adding the predictors to the model has not significantly increased our ability to predict the circumcision.

From the above result of omnibus tests, it is significant at 0.05 levels implying that adding the predictors has significantly increased our ability to predict Circumcision.

Table 9. *Table of appropriate goodness of fit test for the logistic regression model Hosemer and Lemeshow Test.*

Step	Chi-square	Df	p-value
6	5.930	7	0.548

The formal test applied to the good fit of the model is Hosemer and Lemeshow test.

A large p-value indicates a good match whereas small p-value indicates a poor match. For the above test p-value (0.548) it is a good match.

The result of this test suggests that the model is good fit to describe that our model fits the data very well.

Table 10. *Significance variables included in the model.*

	B	S.E.	Wald	Df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Education (1)	-2.595	.675	14.780	1	.000	.075	.020	.280
Best place			8.314	3	.040			
Best place (1)	-.522	.854	.373	1	.541	.593	.111	3.166
Best place (2)	-1.596	.717	4.957	1	.026	.203	.050	.826
Best place (3)	-2.703	1.119	5.831	1	.016	.067	.007	.601
Environment (1)	2.622	.927	8.003	1	.005	13.760	2.238	84.618
Doyouplant (1)	-3.449	1.527	5.098	1	.024	.032	.002	.634
Reason			8.806	3	.032			
Reason (1)	-2.193	.876	6.265	1	.012	.112	.020	.621
reason (2)	-2.977	1.127	6.974	1	.008	.051	.006	.464
reason (3)	-2.536	.937	7.330	1	.007	.079	.013	.497
Constant	3.999	.979	16.683	1	.000	54.563		

Table 10 shows that the significance value of independent variables.

The variables such as, education level of the respondent, the best land/ place the respondent prefer to planted tree, environmental condition, the area of the respondent to plant the trees and the purpose the respondent plant the tree are below the level of significance, α= 0.05. We conclude that each five independent variables are significantly different from zero at 5% level of significance. Therefore, these five independent variables have effect on the development of attitude of the society towards agro forestry practice.

The odd of illiterate 7.5% times to that of literate towards agro forestry practice to changes the attitude of the society given that of the remains independent variables are constant or eliminate. The odds of tree planted around home compounded is 59.3% times effective to that of the tree planted at deforested area to change the attitude of the society given that of the remained independent variable such as education, age, environment and others are constant.

The odds of tree planted at farm boundary is 20.3%

times effective to that of the tree planted at deforested area to change the attitude of the society given that of the remained independent variable such are constant. The odds of tree planted around road is 6.7% times effective to that of the tree planted at deforested area to change the attitude of the society, given that of the remained independent variable such as education, age, environment and others are constant.

The odd of the respondent give the response yes regarding to environmental effect is 13.76 times to that of the respondent give the response no regarding to environmental effect to change the attitude of the society given that of the remains independent variables are eliminated. The odd of the respondent give the response yes regarding to planting tree around home compound/farm is 3.2% times to that of the respondent give the response no regarding to planting tree around home compound/farm to change the attitude of the society, given that of the remains independent variables are eliminate or constant. The odds of for construction is 11.2% times to, that of to conserve species of tree to change the attitude of the society, given that of the remains independent variables such as environment, education, place/land and other are constant. The odds to obtain fuel is 5.1% times that of to conserve species of tree to change the attitude of the society, given that of the remains independent variables such as environment, education, place/land and other are constant. The odds of for to obtain wood is 7.9% times that of to censor conserve species of tree to change the attitude of the society, given that of the remains independent variables such as environment, education, place/land and other are constant.

5. Conclusion

From the total illiterate population 76.1% of the societies were not applicable to practice agro forestry means that they are less satisfactory, but the only 23.9% literate populations are satisfied by their agro forestry. This indicates that condition of education have great effect on the attitude of the society towards agro forestry practices. As we have seen in the analysis in above result and discussion 56.8% of the societies are planting tree species which are both wild and domestic tree species. This indicates that species of tree have not effect on the attitude of the society towards agro forestry practices.

Only 5.2% of the societies were planted at around road and 38.1% of the societies are planted at home compound. 54% of the societies are planning to plant the tree for the future at defrosted area. This indicates that the place or land have effect on the attitude of the society towards agro forestry practices. Because they select the place to plant tree even if they plan to plant tree on deforested area to the future. The variables such as the education condition of the societies, the condition of the environment, the area of the plant are planted, the best place the planter prefer to plant the tree and the reason to plant tree at home compound/farm are the significance variable have effect on the attitude of the societies towards to agro-forestry.

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