Contingent valuation of community plantations in Ethiopia: a look into value elicitation formats and intra-household preference variations

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Abstract

This paper is an application of the contingent valuation method on community plantations in the highlands of Ethiopia. A discrete-continuous elicitation format was applied. It was found that there is a problem in applying a closed ended elicitation format in this context with a community resource since a community resource typically implies a community based scenario and such a scenario invites to yea-saying. The well-known problem of compliance bias is also difficult to avoid in such settings. Application of a closed-ended format under such circumstances would exaggerate the willingness to pay for the good in question. The study asked both spouses in a household for their willingness to pay for a new plantation. The analysis of the bid function shows that there are gender variations in the factors that affect the bids. The common preference model was thus rejected in this application. The analysis also indicates that it might be a good idea to concentrate plantation efforts since there seem to be specialization going on in collection behavior. Women in villages without any existing community plantation are, however, significantly more interested in the establishment of a plantation than men. The aggregate willingness to pay vary dramatically between villages pointing at the need for good selection methods in targeting such interventions.

JEL classification: D13, O13, Q23

Key words: Community plantation; Common preference model; Contingent valuation

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1. Introduction

Ethiopia is experiencing deforestation combined with a high rate of land degradation and expectations of continuing heavy dependence on woody biomass for fuel and construction. A major strategy to satisfy the increasing demand for woody biomass is therefore to increase its supply through tree planting. This is also reflected in numerous project proposals for afforestation or reforestation in the country (e.g. World Bank, 1984; ENEC, 1986; EFAP, 1993). One such scheme is the introduction and expansion of community plantations, also called woodlots.[1] Community woodlots are not new to many Ethiopian peasants. Their history goes back to the second half of the 1970s when they were introduced largely as food-for-work projects in the drought affected areas of Ethiopia. It emerged as a product of the environmental activism and awareness that followed after one of the major famines in modern Ethiopian history. It also came after the seizure of power by the now defunct military-socialist government in 1974 that, among others, nationalized land in 1975 and created peasant associations (PAs) as the lowest administrative units in rural Ethiopia. This new land tenure system and administrative structure implied, at least in theory, that the PAs would have some area of land under their jurisdiction part of which is allocated for individual use by peasants and part of it for communal use by members of the PA, such as communal grazing and forest land. In practice, however, projects such as hill side plantations and construction of soil conservation structures particularly on common lands have been initiated and implemented using a top-down approach with little consultation, if any, with the local communities. The plantations belonged to the government and the labor contribution of the local communities in the establishment of the plantations and soil conservation structures was mainly in exchange for wages paid in kind (food-for-work) largely financed by the United Nations/World Food Program (UN-WFP) with a value of food committed by WFP that was estimated to be slightly over half a billion

[1] This is not the only option available to satisfy increasing demand for woody biomass. Other potential alternatives or complementary options include energy substitution (such as electricity, kerosene, biogas and liquefied petroleum gas), substitutes for construction such as bricks and energy efficiency improving measures such as improved stoves and cooking pots. While the relevance and feasibility of each of these options has to be examined in detail, these may be in general remote possibilities in the near future particularly for rural areas given the supply constraints, cultural and educational constraints and high investment requirements for infrastructure and equipment.

USD for the period 1975-1990 (Admassie, 1995). The full management and use of the plantations that survived until the change of government in 1991 was transferred to the local communities (PAs). However, a number of them have been destroyed either in the transition between the two governments or immediately after the transfer to the local communities due to lack of proper rules and regulations on their management and use (Admassie, 1995). In an evaluation of the soil conservation and afforestation programs, Hoben (1995) observes, "in retrospect, it is clear that much of this effort was wasted or counterproductive", and argues that a neo-Malthusian environmental policy narrative "was used by government and donors alike to justify the rapid, massive and widespread use of standardized environmental management 'packages' without research on their environmental impact or their economic costs and benefits".

Does such an experience mean that there is no need and no future for community woodlots in Ethiopia? Probably not, since community woodlots could, among other things, minimize time spent to collect fuel and increase woody biomass availability for fuel and construction particularly for the landless and those in short supply of labor for fuel collection, not to mention their contribution to possible mitigation of environmental degradation. With respect to tenure security, it would be more secure to introduce forestry programs at the level of the community compared with private plantations particularly if redistribution of individual land by PAs is to continue. But community woodlots would most definitely fail and be unnecessary if they are planned and implemented in the same top-down approach as in the past with little community involvement in the decision making and in the benefits it brings. It is by now well established that the success of common property resources depends very much on the specific rules and regulations and practices that are applied in their management and use (see e.g. Ostrom, 1990; Baland and Platteau, 1996). As Mengistu (1994) argues, the lack of participatory approach in the planning and implementation of social forestry programmes is one major reason for the limited success of past efforts in the forestry sector in Ethiopia and "the initiative for community forest development should emanate from the farmers themselves". This argument is also supported by Gebremedhin et al. (2003) who looked into the determinants of collective action and its effectiveness in the

management of community woodlots in Northern Tigray in Ethiopia. They suggest that collective action may be more beneficial and more effective when plantations are managed at a more local level and when the role of external organizations is more demand-driven.

In this paper we use the contingent valuation (CV) method to examine the determinants of peasants' willingness to pay (WTP) for community woodlots that would be financed, managed and used by the communities themselves. The analysis of such information is likely to help government and international donors to identify salient community features that would increase the targeting and subsequent success of community plantation activities. The study is also an addition to the limited literature on application of the CV method on social forestry in developing countries in general and sub-Saharan Africa in particular.

Since this is a decision that concerns the whole household we also attempt to investigate the possible intra-household variations in preferences for such a plantation. In particular we look at potential differences between males and females. This is done by letting not only the head of the household answer the contingent valuation question, but also the spouse. Using these responses we can also test the common preference model that is underlying most of the empirical household literature. In brief, this model expects that the household maximizes a single utility function subject to a single budget constraint. A similar test, using the contingent valuation method, was done by Lampietti (1999) in Northern Ethiopia for preventive health care within the household. Lampietti considered willingness to pay for bednets and a hypothetical vaccine for malaria and failed to reject the null hypothesis that gender has no significant effect on the decision to purchase bednets but rejected this same null hypothesis for a hypothetical vaccine.[2] In our case the good has an expected gender dimension which makes it particularly interesting to analyze the bid functions of the spouses separately.

[2] Lampietti used 655 observations of either husbands or wives, although not in the same household.

From a methodological point of view, we also examine problems associated with the closed-ended value elicitation format in developing countries like Ethiopia. This is partly based on experience from our previous applications of CV in Ethiopia (Mekonnen, 2000) and India (Köhlin, 2001) where we found internal inconsistencies in the responses. In particular, responses to a follow-up open-ended question were not consistent with the initial answer to a close-ended question. In this paper we investigate the reasons for this inconsistency, when it appears.

The rest of the paper is organized as follows. In section 2 we present survey design and description of the data. Section 3 presents the econometric model, and discusses the subsequent empirical analysis. Section 4 concludes the paper.

2. Survey design and description of data

2.1 Survey design

The data for this paper come from a rural household survey on sustainable land use in the Ethiopian highlands conducted in 2000. The survey covered a total of 1520 households from two zones, East Gojam and South Wollo, in the Amhara region of Ethiopia. Twelve research sites were purposely selected while households within each site were selected at random. There was one supervisor for each of the sites under which enumerators were employed to conduct the interviews.

The scenario was described to the respondents followed by value elicitation questions. In order not to make the scenario too hypothetical a suitable area of land was identified for each site for the establishment of the proposed community plantations. The scenario is described in the appendix. The head of the household (who is typically the husband in our case) and another member of the household (typically the spouse) were asked the willingness to pay questions. Five different starting prices were randomly assigned to

respondents.[3] The closed-ended question was followed by an open-ended question (What is your maximum willingness to pay for the proposed plantation?) This design makes it possible for us to analyze what can be called inconsistent answers. In cases where the 'Yes' response to the closed-ended question was followed by a willingness to pay amount for the open ended question lower than the amount they said yes to in the closed ended question, the respondent was asked why this was the case.

2.2 Description of data

The expressed WTP is expected to depend on characteristics pertaining to the individual, the household, the proposed plantation and alternative sources of biomass in the community. The descriptive statistics for the selected explanatory variables are shown in Table 1. We have two variables that vary at the level of individual – age and literacy. The data show that the average age of the respondent was about 42 years. About 32 percent of the respondents were able to read and write. The average family size was 5.4 with a range of 1 to 14. We have three indicators of household wealth and income – corrugated roof, livestock holding and (non-food) expenditure. A dummy variable indicates whether the roof of the house is made of corrugated iron or not. The data show that about 41 percent of the respondents had houses with corrugated iron roofs. The number of livestock and poultry owned were converted into tropical livestock units and the data show that on average a household owned about 2.8 tropical livestock units. Non-food expenditure was used as an indicator of discretionary income (expected to be positively related to WTP) and the average (non-food) expenditure of a household per year was Birr 931 (about USD 108).

Household resources such as land and trees are expected to be substitutes to community plantations. The average land area "owned"[4] by the households is about a hectare. This average would be higher if we exclude about 10 percent of the households in the sample

[3] The starting prices which were determined based on information from a pilot survey were: Birr 1, 3, 5, 10 and 15 to be paid annually for five years. This range of starting prices corresponded to 0.13 – 1.88 USD at the time of the survey.

[4] All land in Ethiopia is owned by the government. However, households have user right to a particular area of land. It is this area that is referred to as land owned in this paper.

who do not own land at all. As to the number of trees, Table 1 shows an average of more than 400 trees per household. More than three fourths of these are eucalyptus trees. Eucalyptus is also the proposed species in the contingent valuation study and they are very common in Ethiopia in general and in the study area in particular (Jagger and Pender, 2003). About 20 percent of households in our sample did not grow trees at all.

Size of, and distance to, proposed and existing plantations are also expected to influence willingness to pay. For the proposed plantations we use the distance to the household's homestead in minutes. We also asked questions on whether there were any community plantations in the sites and we find that there were no such plantations for about 29 percent of the households. These are captured by a dummy variable for no community plantation.

Table 1. Descriptive statistics

Variable	Description	Mean	Stdv	Min	Max
	Individual characteristics				
Age	Age of respondent in years	41.66	14.82	15	95
Read and write	= 1 if respondent can read and write	0.32	0.47	0	1
Female	= 1 if respondent is female	0.50	0.50	0	1
WTP	Open-ended WTP	3.87	3.79	0	20
	Household characteristics				
Family size	Number of household members	5.35	2.10	1	14
Corrugated roof	= 1 if house has corrugated roof	0.41	0.49	0	1
Livestock	Animal holdings converted to tropical livestock units	2.80	2.42	0	17.4
Expenditure	Non-food household expenditures/year (100 Birr)	9.31	8.36	0.6	76.9
Num. of trees	Number of trees owned by household (100)	4.11	8.03	0	73
No trees	= 1 if household has no trees	0.20	0.40	0	1
Land area	Land area in hectares	0.99	0.87	0	5.7
No land	= 1 if household has no land	0.10	0.30	0	1
No CPL	= 1 if no existing community plantation (CPL)	0.29	0.46	0	1
Distance CPL	Distance to CPL in 10 minutes (0 if no CPL)	21.58	24.13	0	180
Size CPL	Size of existing CPL in ha	1.65	1.72	0	6
Wollo	= 1 if household is located in South Wollo	0.54	0.50	0	1
	Resource characteristics				
Size Ha	Size of proposed plantation in ha	2.46	1.83	1	6
Distance Plantation	Distance to proposed plantation in minutes	41.42	32.38	0	180

3. Results

3.1 Willingness to Pay

In order to estimate the WTP from the closed-ended responses we specify a simple linear WTP function for individual *i* in household *j*

$$WTP_{ij} = \beta x_{ij} + \varepsilon_{ij} \tag{1}$$

where x_{ij} is a vector of variables such as socio-economic, household and village characteristics, β is the corresponding parameter vector and ε_{ij} is an error term. The probability that a respondent will answer yes to a bid *t* is then given by

$$P[Yes] = P[WTP_{ij} > t] = F_{\varepsilon}(\beta x_{ij} - t) \tag{2}$$

where F_{ε} is the cumulative density function of ε. If we assume that the error terms are normally disturbed we have a standard Probit model. Using the Cameron (1988) approach we can easily calculate mean WTP and the effect of the different variables on mean WTP.[5] However, we have an additional problem that needs to be addressed. In most, but not all, cases we observe the WTP from two members of the same household. This means that there can be a common latent heterogeneity. We therefore estimate a random effects probit model. Following Butler and Moffitt (1982) we specify the error term as

$$\varepsilon_{ij} = u_i + v_{ij};\ u_i \sim N(0, \sigma_u^2)\ ,\ v_{ij} \sim N(0, \sigma_v^2) \tag{3}$$

where u_j denotes the unobservable household specific effect and v_{ij} denotes the remainder disturbance. The components of the error term are consequently independently distributed and we have

[5] The expected WTP for individual *i* is given by $\beta x_{ij} / \lambda$, where lambda is the bid coefficient. To obtain the sample mean of WTP one can simply insert the mean values of the variables in x_{ij}.

$$Corr\left[\varepsilon_{tj}, \varepsilon_{sj}\right] = \rho = \frac{\sigma_u^2}{\sigma_u^2 + \sigma_v^2} \tag{4}$$

This is a standard random effects binary panel Probit model, where the panel feature captures the correlation in the error term between the two individuals *t* and *s* in the same household *j*. Again we can use the Cameron approach to recover the parameters of the WTP function and estimate mean WTP.

In total 1320 individuals received a questionnaire that included the contingent valuation question; due to item non-response 1005 are available for analysis. Let us begin by just looking at the responses to the valuation question at the various bid levels; this is reported in Table 2 below.

Table 2. Distribution of closed-ended responses

Bid	Number of respondents	Share of yes responses
1	198	0.92
3	188	0.72
5	203	0.65
10	201	0.38
15	215	0.34

The share of yes responses decrease as the bid increased. Furthermore, the share of yes ranges between 0.92 and 0.34, so the bid vector seems to have been appropriate. Let us now look at the estimated WTP function, which is presented in the table below. In order to investigate if there is a difference between males and females, we include a number of interaction variables between female and resource variables, in addition to a separate female variable that allows for a general difference in WTP between males and females. In addition to the estimated coefficients and the associated p-values we also report the impact of each of the variables on WTP. For all continuous variables we report the marginal effect on WTP. For all discrete binary variables we report the discrete effect on WTP. The results are presented in Table 3.

Table 3. Estimated WTP function, closed-ended responses

Variable	Coeff	P-value	Marginal effect on WTP (discrete for dummy variables)
Intercept	2.6012	0.00	
Age	0.0017	0.81	-0.01
Read and write	0.3346	0.09	1.66
Female	-0.6312	0.05	-3.12
Family size	-0.0111	0.83	0.06
Corrugated roof	0.4702	0.04	2.32
Livestock	0.0006	0.99	0.00
Expenditure	-0.0076	0.54	-0.04
Number of trees	-0.0159	0.14	-0.08
No trees	0.0214	0.93	0.11
Land area	-0.1546	0.37	-0.76
No land	-0.2847	0.62	-1.41
Female * No land	0.3950	0.41	1.95
Distance CPL	-0.0104	0.08	-0.05
Female * Distance CPL	0.0048	0.48	0.02
Size CPL	0.1951	0.01	0.96
No CPL	-1.4159	0.00	-7.00
Female * No CPL	0.6549	0.05	3.24
Size proposed plantation Ha	-0.0626	0.38	-0.31
Distance proposed plantation	-0.0041	0.32	-0.02
Female * Distance Plantation	0.0048	0.36	0.02
Wollo	0.0624	0.83	0.31
Bid	-0.2022	0.00	
Rho	0.6729	0.00	
Number of individuals	1005		
Number of households	603		
	Mean	95% confidence interval	
WTP	10.42	6.88 – 13.95	

The mean WTP (calculated at sample mean) is estimated to 10 Birr for the closed-ended responses. The estimated function gives some interesting information regarding factors affecting households' willingness to pay for community plantations in the Ethiopian highlands and how this differs between genders. In our sample the gender effect is compounded with the effect of being head of household since 95 percent of the male respondents are also the heads of the households.[6] When we discuss gender effects in this paper, this should therefore be seen as the combined effect of both being female and not head of the household. If we start with the *individual and households characteristics* we find that the age of the respondent does not have a significant effect on the WTP and the literacy of the respondent has a positive effect at a 10% level of significance. Interestingly,

[6] The correlation coefficient between male respondent and head of household is 0.8.

there are large differences in WTP between males and females. A female respondent has a mean WTP that is more than three Birr lower than a male respondent. However, this does not hold for households in villages without any existing plantation since the interaction term between female and no CPL is of the same magnitude. Our indicators of wealth and disposable income give mixed results. Corrugated roof has the expected positive sign and is significant. However, both livestock and expenditure – the latter used as a proxy for discretionary income in this cash constrained economy - are insignificant.[7] This could mean that the nature of the good is fairly neutral with regards to income and wealth – there are for example no real substitutes to biomass as domestic fuel in these areas. The absence of any strong group opposing new plantations is positive for the possibility to achieve widespread acceptance for such a village investment. Given that poor people are more constrained in their responses to the bid questions the positive and significant coefficient for corrugated roof cannot be taken as an indicator that such interventions would have negative distributional implications. The number of private trees that the household owns is insignificant. This is interesting since it implies that public and private trees are not close substitutes. A household could for example receive fuelwood from a public plantation and subsequently sell more of its private trees as poles on the market. Neither does land area or whether the household owns any land or not have any significant effect on the WTP.

The *resource characteristics* have mixed explanatory power. The size of the proposed plantation is not significant. The distance to the proposed plantation has the expected negative sign but is also insignificant. However, with regards to existing community plantations we find a very interesting result. While one would expect that those who do not have a community plantation would have a higher WTP than those who have, here we find the opposite. The effect is highly significant and indicates an average WTP of seven ETB more in villages with an existing plantation compared to the villages without any plantation. This should be compared to the mean WTP of 10 ETB. However, as mentioned

[7] It can be noted that this does not seem to be a general result. Mekonnen (2000) finds that income is positive and highly significant in explaining WTP for a similar plantation as the one proposed here. Köhlin (2001) finds in a similar application in India that land size has a positive and significant effect on the probability of willingness-to-pay a positive amount..

there is a difference between males and females in this respect since women in villages without plantation have a significantly higher WTP than the men in these villages. The main result still holds though, that households in villages with an existing plantation have higher WTP than households in villages without plantation. The most likely explanation to this is an adoption to community plantations as a source of biomass.[8] The policy implication is that it might be better to target plantation activities to communities that already have plantations than to those who do not. This result was also found for community plantations in India (Köhlin, 2001). Furthermore, this general result is also supported by the negative impact of distance to the existing CPL. The further away an existing plantation is the lower the WTP for a new plantation.

3.2 Compliance bias in a closed-ended setting

If we compare our results from the closed-ended analysis with the open-ended results, we find the familiar result:[9] mean WTP from the closed-ended format is much higher than that from the open-ended format; in this case more than 3 times higher. The result is even stronger considering that the open-ended question was asked directly after the closed-ended question. A closer look at the responses even reveals that there is a non-negligible share of respondents that give a lower WTP in the open ended follow-up question than the value of the closed ended question that they had just accepted. We have had previous experience of this type of inconsistency of these elicitation formats on community plantations in developing countries (Mekonnen, 2000; Köhlin, 2001). A number of hypotheses have been raised as to the origin of this inconsistency including yea-saying (or compliance bias), strategic behavior and a cultural experience of bargaining that might be triggered by the format (Köhlin, 2001).[10]

[8] A less likely explanation, in our opinion, would be that previous plantations had been carefully targeted to villages with higher demand for such plantations and that we don't capture the underlying factors for this in our explanatory variables.

[9] The general tendency that has been found in the literature is that the open-ended format results in lower WTP estimates than the closed-ended format; see for example Brown et al. (1996) and Kriström (1993).

[10] We will denote this type of behaviour as inconsistent, although we are well aware that respondents themselves might not see this as inconsistent behaviour. So we are not passing any judgement on this type of behaviour.

In order to investigate this in more detail we included a follow-up question to those who gave inconsistent answers. In our sample about 15 percent of the respondents gave an inconsistent answer, in the sense that their maximum willingness to pay was lower than the amount that they said yes to in the initial closed-ended question. When asked for the reasons for the inconsistency, about 59 percent responded that they initially thought it was an obligation to contribute, while 11 percent wanted to please the interviewer. This means that around 70 percent of the inconsistent responses seem to stem from yea-saying or compliance bias. About 11 percent responded that they are poor. Also for these respondents, it is questionable whether their responses to the closed ended question actually reflected their true WTP. Finally, around 17 percent gave another reason for their behavior. Taking these results at face value, one should be careful in interpreting the results from the closed-ended part of the survey. There seems to be some compliance going on in the survey situation. We have estimated a simple probit model in order to find if there is any systematic relationship between the inconsistencies and our explanatory variables. It turns out that it is difficult to explain inconsistency. None of the individual or household specific variables have a significant effect. What we do find is that individuals that have no land or no access to a CPL are more likely to be inconsistent, in addition to respondents from Wollo and a few other variables. Furthermore, as perhaps expected, the probability of being inconsistent is higher at higher bid levels.[11] Even if it is difficult to find what the determinants of this compliance are, we can still in a crude manner investigate the impact of this on the estimated WTP. There are several ways we can do this. One is to simply reject inconsistent responses and re-estimate the model on the reduced sample. Another, more extreme, is to keep all observations, but recode inconsistent yes responses into no responses.[12] In the first case, mean WTP is then estimated to be 8.5 Birr, but it is not significantly different from the original estimate of 10.4 Birr, although the tendency is clear. In the second case, mean WTP is by definition lower, 7 Birr, and significantly different from the original estimate.

[11] The full sets of results are available upon request from the authors.
[12] This is similar to the approach of using follow-up certainty questions and correcting/adjusting WTP based on how certain a respondent is, see for example Champ et al. (1997) and Champ and Bishop (2001).

Our results, in particular the follow-up questions, shows that one should be careful with implementing a particular elicitation format. Although the closed-ended format might have certain properties that are valuable, such as simplicity and incentive compatibility (Carson et al., 2000), other properties such as anchoring on bid levels and the informational content might mean that the format should not be used. Furthermore, there are experimental results showing that the hypothetical bias – the bias introduced by asking a hypothetical question and not confronting the respondent with a real situation – is not higher, or even lower, for the open-ended format compared with the closed-ended format (List and Gallet, 2001; Baliestreri et al., 2001).

4. Concluding remarks

This application of the contingent valuation method on community plantations in the highlands of Ethiopia has made some methodological and policy contributions. We have found that there could be a problem in applying a closed-ended elicitation format to community resources in developing countries since a community resource typically implies a community based scenario and such a scenario invites to yea-saying. The well-known problem of compliance bias is also difficult to avoid in such settings. Application of a closed-ended format under such circumstances would exaggerate the WTP for the good in question.

The study has also shown that it is possible to not limit such surveys to heads of households, at least for this sample. Their spouses are perfectly capable of answering WTP questions, although the analysis of the bid function shows that the factors affecting their bids differ. The common preference model, which assumes a single utility function was thus rejected in this application[13] and it can be recommended that separate interviews are made with heads and spouses when it comes to valuation of local natural resources where there could be gender differences in preferences, labor allocation and utilization. The

[13] The results presented in this paper are based on an unbalanced panel that also includes households where only one person answered the WTP questions. For a more stringent test of the common preference assumption we also analyzed a balanced panel with only households with two spouses answering. We found the same result as presented here where the dummy for female respondent was significant at the five percent level.

analysis of the bid function also indicates that it might be a good idea to concentrate plantation efforts since there seems to be specialization going on in collection behavior. In general, interventions such as community plantations should be sensitive to the local demand. An analysis of the open ended follow-up bids shows that the village means differ by almost a factor of three. Similarly, if also village population and the size of the proposed plantation is taken into consideration, then we find a variation in annual aggregate village WTP per ha of community plantation ranging from 1301 Birr to 8285 Birr. Such variations imply that the Ethiopian government, the World Food Program and other donors involved in the provision of community plantations in Ethiopia need to develop good tools for the selection of locations for such plantations if they seekto maximize their contribution to welfare.

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Appendix. The Contingent Valuation Scenario

The village has the opportunity to initiate community investment. Consider if the Kebele Administration in collaboration with the people plans to establish a community plantation. The community plantation would have the following characteristics.

Place where the community plantation will be located _____
Distance of the proposed plantation from your home _____
Area of land to be covered by the proposed community plantation _____
The land intended for the plantation is being used for _____ purpose.

The following are benefits obtained as a result of establishing the community plantation. The trees could be used as sources of fuel. After a certain period of time community services can be established for the community by selling the trees or it can be shared among the members. Indirectly, the forest has its own benefits. For instance, you can use dung and crop residues to increase the fertility of the land you cultivate rather than using them as fuel sources. You can also save time spent on collecting the fuels. However, the land occupied by the forest could not be used for other purposes. So, please consider the advantages and disadvantages of the proposed community plantation to answer the following questions. The plantation would be paid for by the contribution of the Kebele members and it will be controlled and managed by a committee selected from the members of the Kebele. The decision to establish the forest will be made after the community agrees to cover the necessary expenses. For the time being, the cost of the plantation is not known in advance. However, we want to know if you are willing or not willing to contribute money for the activity. The contribution will be made annually for five consecutive years. Remember, the money that you are going to contribute could not be used for any other purpose.

Do you want to contribute for the community forest?
Yes …. 1 No …..2

As we have stated earlier, the cost required is not known in advance. However, if you are a decision maker in your household and are asked to contribute Birr _____ annually for five consecutive years, would your household be willing to contribute the money? The money will be collected by a committee established from the community after the main harvest time.
Yes …. 1 No …..2
What would be the maximum amount your household would be willing to pay per annum for the five consecutive years?

…..…… Birr