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# Evaluation of Farmers' Willingness to Pay (WTP) for Sesame Seed Driller Machine Rental Service in Kafta-Humera District, Western Tigray, Ethiopia

**Yemane Hailu Gebre[1*]**

*[1]Department of Socioeconomic and Extension Research, Humera Agricultural Research Center, P.O.Box-62, Humera, Tigray, Ethiopia.*

***Author's contribution***

*The sole author designed, analysed, interpreted and prepared the manuscript.*

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## ABSTRACT

The use of row planter in Ethiopia for sesame production is almost at the infant stage, and most seeds were typically sown through manual broadcasting as the tariff of imported agricultural machinery (row planter) is high. This shows that poor and small-scale farmers are unable to purchase row planter/sesame seed driller machine/ as its cost is expensive and their land is small. Hence, this study has assessed farmers' willingness to pay to rent sesame seed driller machine service by conducting a survey of 124 farmers in Kafta-humera district, western Tigray, Ethiopia. A survey questionnaire related to CVM was designed and face-to-face interviews were made to collect the data. The descriptive result showed that 85.48% of the farmers were willing to rent the Sesame seed driller machine with a mean of ETB 911.37 per hectare. The Probit regression results confirm that the educational level, access to extension service, the income of the household, and access to credit were the factors that affecting the farmers' level of willingness to pay positively. However, the cultivable land size was negatively influencing willingness to rent sesame seed driller machine by the farmers. Regarding the perception of farmers, majority of the respondents were perceived positively particularly with the statements of "sesame seed driller machine decreases weed occurrence and makes easy to control weed, increases sesame grain yield and it makes

**Corresponding author: E-mail: yemanehaile15@gmail.com;*

farmers financially profitable". However, they perceived negatively on that it drills a higher seed rate and missed plant to some extent. The study, therefore, recommends encouraging well educated and better off people to engage in sesame farming, overhauling agricultural extension services. Moreover, it is suggested that investors, cooperatives or private companies should introduce sesame seed driller machine not only for themselves but also to rent service at a fair price.

*Keywords: Willingness to pay; sesame seed driller machine; rental service; contingent valuation method.*

## ABBREVIATIONS

*WTP : Willingness to Pay*
*CVM : Contingent Valuation Method*
*ETB : Ethiopian Birr*
*HuARC : Humera Agricultural Research Center*

## 1. INTRODUCTION

Sesame is an important oilseed crop grown in Ethiopia and plays a vital role in the economic development of the country both in terms of its foreign exchange earnings and as the main source of income for the livelihood of the people [1]. Over three million small, medium, and large scale Ethiopians farmers are involved in sesame production [2,3]. Different reports indicate also that Ethiopia is ranked sixth in the world [4] and third in Africa [5,6] in terms of sesame production. Similarly, in terms of export, Ethiopia is the third world exporter of sesame seeds after India and Sudan [7,8]. Sesame is Ethiopia's 2nd largest cash export crop behind coffee accounts for over 80 percent of the total oilseeds' export earnings [9].

Though the sesame seed market has demand in the world market is increased from time to time, sesame production in Ethiopia is faced with various challenges that need to be addressed as the sesame production in most areas of the country is carried out under traditional production [9]. It has been argued recently that the practice of planting sesame seed by hand using also known as broadcasting has become one of the major causes for lowering sesame productivity and profitability and increasing production costs such as cost of thinning and weeding. However, research in other countries has suggested that using agricultural mechanization technologies is not only important to minimize the cost of production and reducing time but also enables to utilize the bio-chemical inputs (fertilizers) efficiently. For instance, [10] showed that wheat row planter which permitted side placement of fertilizer increased grain yields by 12.5% and decreased labor requirements by 39.5%. The overall return was also above 13%. Similarly, a one-row planter with metering and side placement of increased corn yields 40% and decreased hours 36% from those of conventional planting.

However, the use of row planter in Ethiopia for sesame production is almost at the infant stage, and most seeds were typically sown through manual broadcasting as the tariff of imported agricultural machinery (sesame seed driller machine) is high. This shows that except large-scale farmers, both medium and smallholder farmers are unable to purchase sesame seed driller machine as its cost is expensive and their land is small. Though, renting for sesame seed driller machine service could an alternative option in the study area, estimating the cost of the sesame seed driller machine rent service was found to be a crucial activity before introducing and dissemination of the non-market technologies. The study, therefore, tried to assess farmers' willingness to pay to rent sesame seed driller machine service and estimate the maximum WTP to rent the service as well as to assess the awareness and perceptions of farmers on sesame seed driller machine in Kafta-Humera district, Tigray, Ethiopia.

## 2. METHODOLOGY

### 2.1 Sampling Technique and Sample Size Determination

The target population of this study was sesame grower farmers. A two-stage sampling technique was adopted for the study. First, 4 PAs (Adebay, Hilet-koka, rawyan and Irop) were purposively chosen from Kafta-humera which is the largest sesame producer and exporter district. This was based on the prior information obtained that they may have little information regarding farm mechanization (sesame seed driller machine) as a demonstration of sesame seed driller machine

has been conducted in those kebeles by Humera Agricultural Research Center (HuARC) and other developmental agencies at different times. In the second stage, 124 sesame farmers were selected from the four Kebele's by random selection.

## 2.2 Data Collection and Method of Data Collection

For this study, both quantitative and qualitative data types were collected. Both primary and secondary data were used for this study. Primary data were sourced from the sesame farmers in the study area with the use of a structured questionnaire. Data collected include the socio-economic profile of the farmers, perception of the farmers on the sesame seed driller machine, willingness to rent, the maximum amount that the farmers were willing to rent the sesame driller machine. Supporting secondary data were collected by reviewing relevant documents such as from different journal, articles, paper, and report of pastoral development office of the district.

Willingness to pay is defined as the amount that must be taken away from the household's income to rent the service of the sesame seed driller machine. A survey questionnaire related to the Contingent valuation method (CVM) was designed and a face-to-face interview was made to collect the willingness data. CVM is a widely used technique for estimating non-market benefits such as benefits of environmental goods and services especially in developing countries [11,12]. CV surveys ask respondents what they are (hypothetically) willing to pay for a well-defined good or service. The Contingent valuation method which was used in this study involves asking individuals directly in hypothetical surveys; the maximum amount they are willing to pay (WTP) to rent the service of sesame seed driller machine. This method can generate accurate values of non-market goods and services [13].

There are different elicitation techniques (open-ended questions, payment card approach, Iterative bidding approach, dichotomous choice format, and the bidding game elicitation techniques). However, in this study, the iterative bidding approach was used as it still being widely used in similar studies. The study of the willingness of farmers to pay row planter rent service using the iterative bidding approach normally involves two stages: in the first stage, respondents were asked if they would be willing to rent sesame seed driller machine service to determine the decision of renting. In the second stage, based on the iterative bidding technique, it starts by asking individuals at some initial hypothetical bid (in this case 1200ETB/ha). The respondents were asked either to answer "Yes" or "No" to the initial hypothetical bid (1200ETB/ha). If his answer is Yes, the initial amount would raise by adding ETB50 until the respondent says "No" whereas, if his/her answer is "No" minimizing (lowering) the initial amount (bid) by declining ETB50 until he/she says Yes. The final amount is interpreted as respondent's maximum WTP for renting sesame seed driller machine service per ha.

## 2.3 Methods of Data Analysis

To analyze the data, both descriptive statistics and the econometric model were employed.

## 2.4 Descriptive Analysis

Both descriptive and inferential analyses were employed to measure the objectives of the study. As descriptive statistics, frequency distribution, mean, maximum and minimum, percentage distribution, and standard deviation were employed to analyze the quantitative data. Chi-square was used to identify the associations between categorical variables while a t-test was used to compare mean differences between two groups across the continuous variables. To analyze and determine the average maximum amount that the respondents were willing to rent sesame seed driller machine service was calculated by adopting [14] formula.

$$\text{Average WTP} = \frac{\text{Sum of bidding amounts}}{\text{Total number of respondents who were willing to pay}}$$

## 2.5 Econometric Model

In this study, farmer's willingness to pay for sesame seed driller machine rent service is a dichotomous variable (1= willing to pay and 0 = non-willing to pay for sesame seed driller machine). Hence, the probit model guarantees that the estimated probabilities lie in the range 0 to 1 [15]. So in this study, following [16], the Probit model was used to assess the effects of the independent variables on the probability of the respondents' willingness to rent a sesame seed driller machine service. The empirical

model measuring the probability that a farmer was willing to rent sesame seed driller machine service was expressed as

$$Pi = F(WTPi) = \frac{1}{1+e^{-WTPi}} = \frac{1}{1+e^{Xi+\varepsilon i}} \quad (1)$$

Where i=1,2,3,…..n

$P_i$ is a probability function, which is the farmer's yes/no response to the willingness to rent sesame seed driller machine service. $WTP_i$ is the willingness to rent sesame seed driller machine service. $X_i$ is a vector of observed characteristics of an individual. They include the socio-economic attributes of the respondents. For this study, equation (1) is expressed implicitly as

$$WTP = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, \varepsilon \quad (2)$$

WTP= Willingness of the respondents to rent sesame seed driller machine service (1 if yes, 0 if otherwise)

$X_1$ = Sex of the household head (1 if male, 0 if otherwise)

$X_2$ = Age of household head (years)

$X_3$ = Education level of the household head (1 if literate, 0 if illiterate)

$X_4$ =Household family size

$X_5$ = accesses to extension service (1 if yes, 0 if otherwise)

$X_6$ = Farm size (hectares)

$X_7$ = Income of the household head (in thousand ETB)

$X_8$ = Participation of the household head on social organization (1 if yes, 0 if otherwise)

$X_9$ = Access to credit (1 if yes, 0 if otherwise)

$\beta_1, \beta_2, \ldots\ldots\ldots\beta_9$ are parameters corresponding to estimated variables' coefficients. $\varepsilon_1$ is the error term and consists of unobservable random variables.

## 3. RESULTS AND DISCUSSION

### 3.1 Willingness to Pay for Sesame Seed Driller Machine Service Rent

Table 1 revealed that the majority of the respondents (85.48%) were willing to pay for sesame seed driller machine rent service and 14.52% of the farmers were not willing to rent. The main reasons identified by the respondents for not willing were fear of risk & expensiveness, not available on time, and might not be better than farmer's practice.

**Table 1. Distribution of respondents willing to pay for sesame seed drill machine technology**

| | Willing to rent | Not-willing to rent | Total |
|---|---|---|---|
| Frequency | 106 | 18 | 124 |
| Percent | 85.48% | 14.52% | 100% |

### 3.2 Description of Sample Households' Characteristics

The continuous and discrete variables entered into the Probit model are indicated in Tables 2 and 3 respectively. Mean and standard deviation of continuous variables and scores of discrete variables are included. To see the presence of statistical differences among socioeconomic variables with the willingness to pay to rent row planter machine, t-test and $\chi^2$ tests were employed.

From the four continuous variables, 2 of them showed a significant difference between willing and not willing to pay to rent sesame seed driller machine. Cultivated land size and income of the household head were significant variables in influencing willingness to pay for sesame seed driller machine, whereas age and family size of the household were insignificant variables.

**Table 2. Socio-economic profile of the respondents for continuous variables**

| Variable name | Willing to rent | | Non-willing to rent | | t-test value |
|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | |
| Age of the HHH(years) | 45.76 | 11.74 | 47.94 | 14.95 | 0.6986 |
| Family size of the HHH | 5.52 | 2.12 | 4.78 | 1.96 | -1.3849 |
| Land size of the HHH (ha) | 5.43 | 4.78 | 8.17 | 7.9 | 2.0185** |
| Income of the HHH(ETB in 000) | 68.93 | 21.10 | 52.10 | 20.19 | -3.1472*** |

In this study, the average age of willing and not-willing farmers to rent sesame driller machine service was 45.76 & 47.94 years respectively. The t-test value of age is not significant; which implies that there wasn't a significant difference between the age of willing and not-willing farmers to rent sesame driller machine service.

The average household size of farmers who were willing and not willing to rent sesame driller machine service was 5.52 and 4.78 persons respectively (Table 2). The t-test value of family size is insignificant; which implies that there wasn't a significant difference in family size between the two groups.

The livelihoods of the farming communities in the study area primarily depend on agriculture where crop production plays an important role. Farmers need to have enough land own for cultivation to produce different crops. In addition to the presence of land, tenure pattern also matters as to the utilization of land resources. The average landholding of farmers who were willing and not willing to rent a sesame seed driller machine was found to be 5.43 ha and 8.17 respectively. The result of the t-test shows that there was a negative and statistically significant mean difference at 5% significance level in farmland size between the willing and not-willing farmers to rent sesame driller machine service.

Rural people derive income from multiple sources both from within and outside agriculture. Crop, livestock, on-farm, and off-farm income play an important role for households in the study area. As shown in Table 2, the mean of income is 68.93 thousand and 52.10 thousands for willing and not-willing farmers to rent row planter service. The t-test value of income is statistically significant at a 1% significance level. This shows that the better-off farmers were more willing than lower income.

From discrete variables, educations of household, access to extension service, access to credits were significant variables (Table 3).

Table 3 shows the sex composition of the sample household heads. Of the total sample farm households, 84.68% were male-headed and the remaining 15.32% were female-headed implying that more of the sample households were male. The shares of male-headed households of willing and non-willing farmers for renting row planter were 86.79% and 72.22% respectively and the rest of them were female-headed. The Chi-square test result showed that there is no statistically significant difference between the two groups concerning the sex composition of households. Referring to Table 2, around 62.9% of the sample households were literate and the remaining and 37.10% were illiterate. The literacy level was hypothesized to have a positive effect on the willingness to rent. The result of this study shows that out of the 106 farmers willing to rent a sesame seed driller machine, 66.04% of them were literate whereas, only 44.44% of the non-willing farmers were literate. The Chi-square statistics ($\chi^2$= 3.0746; P= 0.080) of household heads indicate a statistically significant difference at a 10% significance level in the educational status between the two groups.

In the study area, the availability of extension service to farmers plays an important role in terms of creating knowledge and skill in using improved agricultural inputs. Regardless of the country's huge and extensive investment in promoting extension services, the study result revealed that 69.35% of the sampled respondents received extension service on sesame seed driller machine with large variability between the two groups. Concerning this variable, 74.53% and 38.89% of the willing and not willing to rent the sesame seed driller machine farmers respectively had extension service (Table 3). The difference in access to extension service across the two categories was estimated to be significant at a 1% significance level ($\chi^2$= 9.1956; P= 0.002).

**Table 3. Socio-economic profile of the respondents for dummy variables**

| | Desc. | Willing to rent | | Not-willing to rent | | Total | | Chi-Square ($\chi^2$) |
|---|---|---|---|---|---|---|---|---|
| | | Ferq. | % | Ferq. | % | Ferq. | % | |
| Gender | Male | 92 | 86.79 | 13 | 72.22 | 105 | 84.68 | 2.5176 |
| | Female | 14 | 13.21 | 5 | 27.78 | 19 | 15.32 | |
| Literacy | Yes | 70 | 66.04 | 8 | 44.44 | 78 | 62.90 | 3.0746* |
| | No | 36 | 33.96 | 10 | 55.56 | 46 | 37.10 | |
| Access to extension | Yes | 79 | 74.53 | 7 | 38.89 | 86 | 69.35 | 9.1956*** |
| | No | 27 | 25.47 | 11 | 61.11 | 38 | 30.65 | |
| Social organization | Yes | 58 | 54.72 | 8 | 44.44 | 66 | 53.23 | 0.6522 |
| | No | 48 | 45.28 | 10 | 55.56 | 58 | 46.77 | |
| Access to credit | Yes | 87 | 82.08 | 9 | 50 | 96 | 77.42 | 9.0556*** |
| | No | 19 | 17.92 | 9 | 50 | 28 | 22.58 | |

In the realm of rural and agricultural development, the importance of social capital is perceived as a willingness and ability to work together. The very likely assumption on which the relationship between social capital and adoption is anchored is that neighboring agricultural households are, de facto, members of a social structure who exchange information about improved agricultural practices. [17] concludes that: "The heart of the diffusion process consists of interpersonal network exchanges between those individuals who have already adopted innovation and those who are then influenced to do so". In the current study, social participation stands for the participation of the respondent in informal and formal organizations as a member and leader. Farmers who have some position in PA and different informal and formal associations and organizations are more likely to be aware of new practices as they are easily exposed to information. Therefore, a positive and significant relationship was expected. However, the analysis of field data shows that there is no significant relationship between willingness to rent sesame seed driller machine and participation in different social organizations ($\chi^2$= 0.6522; P= 0.419).

Farmers who have access to credit can overcome their financial constraints and therefore buy inputs. Farmers without cash and no access to credit will find it very difficult to attain and adopt new technologies. It is expected that access to credit will increase the probability of adopting agricultural technologies. In this study too, this hypothesized proposition is supported by the significant relationships found between access to credit and willing to rent sesame seed driller machine at a 1% significance level ($\chi^2$ = 9.0556; P= 0.003). This implies that sesame farmers who access credit from the financial institutions are more likely to rent a sesame seed driller machine as compared to those who cannot access credit.

### 3.3 Maximum Amount of Willingness-to-Pay for Sesame Seed Driller Machine Rent Service/ha

Table 4 shows the maximum amount that the respondents were willing to rent Sesame seed driller machine rent service.

The results show that 76.42% of the willing respondents were willing to pay < ETB 1200 ETB on average ETB 790.74 per hectare with a range of ETB 400 – 1100 per hectare. 16.98% of the willing respondents were willing to pay > 1200 ETB on average ETB 1341.67 per hectare with a range of ETB 1250 – 1500 per hectare. The Overall result indicated that the mean maximum amount of money that farmers' are willing to pay for sesame seed driller machine rent service was ETB 911.32 per hectare.

**Table 4. Respondents' distribution of prices willing to rent sesame**

| (ETB/ha) | Number of Respondents | % | Mean (ETB) | SD | Minimum (ETB) | Maximum (ETB) |
|---|---|---|---|---|---|---|
| <1200 | 81 | 76.42 | 790.74 | 194.31 | 400 | 1100 |
| 1200 | 7 | 6.6 | 1200 | 0 | 1200 | 1200 |
| >1200 | 18 | 16.98 | 1341.67 | 79.06 | 1250 | 1500 |
| Mean | 106 | 100 | 911.32 | 279.82 | 400 | 1500 |

### 3.4 Determinants of Farmers' Willingness to Rent Sesame Seed Driller Machine Service

The probit regression was estimated for the number of variables which expected to affect how much the farmers are willing to pay for the sesame seed driller machine renting services. Table 5 presents nine variables that were used to determine farmers' willingness to pay to rent a sesame seed driller machine. These variables include Sex of the household head (SEX), age of household head (AGE), education level of the household head (EDUC), family size of the household head (FAMSZ), access to extension service (EXTN), Size of cultivated land (LANDCULT), income of the household head (INCOME), participation of social organization (SOCIALORG) and access to credit (CREDIT). Among the variables used, five of the variables (education level of the household head, access to extension service, size of cultivated land, income of the household head, and access to credit) were found to be statistically significant at different levels of significance, however, four of them were insignificant. The results are presented in Table 5.

#### 3.4.1 Education (EDUC)

Educated farmers tend to use modern agricultural technologies, use agricultural extension advice and information, and diversify their source of income than uneducated farmers. The output of the model indicates that holding other explanatory variables constant, the educated household head had a probability of being more willing to pay to rent row planter by a factor of 11.7%. It is significant at a 10% significance level. This shows that education is central to boosting investment to increase the demand of sesame seed driller machine to increase the production and productivity of sesame.

#### 3.4.2 Access to extension service (EXTN)

Participation in extension events is the other means through which farmers get information and make decisions regarding improved practices. Such events include extension arrangements such as training, demonstration, field days or visits, and extension exhibitions. In the model, the participation of farmers in these events was considered as one aggregate variable. The result of the finding indicated participation in extension events was positively and significantly related to willingness to pay for sesame seed driller rent service at a 5% probability level. The marginal effect of the model shows that holding other things constant, the probability of household to be willing to pay to rent row planter machine increase by 12.6% as a household has access to extension service. The implication is that emphasis has to be given to farmers' training, participation in the demonstration, field days and extension exhibitions to enhance the use of sesame seed driller machine by sesame farmers.

**Table 5. Determinant of farmers' willingness to pay to rent a sesame seed driller machine**

| Variable | Dy/dx | Std. Err. | Z | P>z |
|---|---|---|---|---|
| SEX | .0534251 | .07591 | 0.70 | 0.482 |
| AGE | -.0016752 | .00166 | -1.01 | 0.314 |
| EDUC | .1165281 | .06058 | 1.92 | 0.054 |
| FAMSZ | .0017941 | .01107 | 0.16 | 0.871 |
| EXTN | .1262176 | .06112 | 2.07 | 0.039 |
| LANDCULT | -.0110277 | .00475 | -2.32 | 0.020 |
| INCOME | .0032218 | .00133 | 2.42 | 0.016 |
| SOCIALORG | .0190693 | .0469 | 0.41 | 0.684 |
| CREDIT | .1631675 | .08451 | 1.93 | 0.054 |
| Number of obs =124 | | | | |
| Wald chi2(9) = 29.97 | | | | |
| Prob > chi2 = 0.0004 | | | | |
| Log pseudolikelihood = -35.080079 | | | | |
| Pseudo r2 = 0.3170 | | | | |

### 3.4.3 Size of cultivated land (LANDCULT)

In the study area, the size of cultivated land has a negative influence on the probability of willingness to pay for row planter renting. It was significant at a 5% significance level. Farmers who cultivate larger farmland would be less willing to pay to rent row planter service than those households with smaller land size. The result also shows that all other factors kept constant, the probability of willingness to pay for row planter renting is decreased by 1.1% with the increase in the size of cultivated land by one hectare.

### 3.4.4 Income of the household head (INCOME)

The farmers in the study area generate income from different sources. They generate income from crops, sale of livestock and livestock products, on-farm, and off-farm activities. Income from different income sources makes farmers have purchasing capacity and farmers can purchase different agricultural inputs. When the agricultural inputs are expensive such as sesame seed driller machines, they would also volunteer to pay to rent the machine. The result is also statistically significant at 5% significant level. The marginal effect of the model shows that keeping other factors constant, the probability of household to be willing to pay to rent row planter machine increase by 0.3% as household income increase by one thousand.

### 3.4.5 Household access to credit (CREDIT)

The results of the survey revealed that the variable under consideration is positively related and significant at less than 10 percent probability level with the willingness to pay for sesame seed driller machine. The marginal effect of the model shows that holding other things constant, the probability of household to be willing to pay to rent row planter machine increase by 16.3% as a household has access to credit.

### 3.4.6 Perception of farmers on the attributes of Sesame seed driller machine

Farmers' awareness of the attributes of the Sesame seed driller machine was assessed (Table 6). The survey result showed that 64.52% (80) of the sample respondents perceived that using the Sesame seed driller machine was one of the most important methods of increasing sesame production and productivity whereas only 4.03% of the respondents were not agreed with the respective statement.

Regarding the optimum amount of seed rate, out of the total respondents, only 27.42% (34) respondents were perceived positively and the rest 57.26% (71) and 15.32% (19) respondents were responding no change and disagreed respectively. Referring to Table 6; the findings also indicated that 22.58%, 43.55% and 33.87% of the sampled respondents were agreed, cannot say anything, and opposed respectively with the statement that "Sesame seed driller machine drills with no missed". This indicates that there is a miss perception of farmers regarding using the technology. The possible reason can be the limited skill of the operators as the technology is new. Of the total respondents, about 60.48% of them perceive that Sesame seed driller machine is important to minimize weed occurrence and makes easy to control the weeds whereas 37.1% of the respondents have no difference and the rest of the respondents (2.42%) disagreed with the contribution of Sesame seed driller machine in controlling weeds (Table 6). Results in Table 6 revealed that 70.97% (88) respondents confirmed the statement that "using sesame seed driller machine makes economically profitable"

**Table 6. Farmer's perception on the attributes of Sesame seed driller machine**

| Attributes | | Perception | | |
|---|---|---|---|---|
| | | Agree | Neutral | Disagree |
| Using sesame row planter increases grain yield | Freq | 80 | 39 | 5 |
| | % | 64.52 | 31.45 | 4.03 |
| drills optimum amount of seed rate | Freq | 34 | 71 | 19 |
| | % | 27.42 | 57.26 | 15.32 |
| drills with no missing plant/jump drilling | Freq | 28 | 54 | 42 |
| | % | 22.58 | 43.55 | 33.87 |
| makes easy to control weed | Freq | 75 | 46 | 3 |
| | % | 60.48 | 37.1 | 2.42 |
| Using sesame seed driller machine makes economically profitable | freq | 88 | 29 | 7 |
| | % | 70.97 | 23.39 | 5.64 |

whereas 23.39% (29) respondents and 5.56% of respondents cannot say and opposed this statement respectively.

## 4. CONCLUSIONS AND RECOMMENDATIONS

Demand was growing for row planting as farmers' awareness for the sesame seed drill machine is developing. More than 85.48% of the respondents were willing to pay for seed driller service rent. The average maximum amount of money that will be paid for sesame seed driller machine rent is fair and it is estimated to be ETB 911.37 per hectare. Adoption or rejection of technologies by farmers may reflect rational decision-making based upon farmers' perceptions of the appropriateness (inappropriateness) of the characteristics of a given technology. Regarding the perception of farmers on the Sesame seed drill machine, the majority of the respondents were perceived positively particularly with the statements of “it decreases weed occurrence and makes easy to control weed, increases sesame grain yield and it makes farmers financially profitable". However, negatively perceived that sesame seed driller machine drills a higher seed rate and to some extent missed plant. It is recommended that investors, cooperatives or private companies should introduce sesame row planter not only for themselves but also to rent service at a fair price (< ETB 911.37 per hectare). It will be better if training is given to operators and then both operators and should take special care. Moreover, it will be better if the government creates an enabling environment for effective participation of the private sector mean that the government should create awareness to involve private sectors on renting sesame seed driller machine business.

## CONSENT

As per international standard or university standard, respondents’ written consent has been collected and preserved by the author(s).

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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